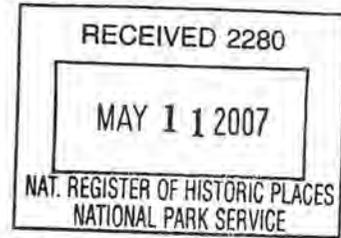


Concrete in the Steel City: The Edison Concept Houses of Gary, Indiana

NPS Form 10-900-b
(Rev. Aug. 2002)

OMB No. 1024-0018
(Expires 1-31-2009)

United States Department of the Interior
National Park Service



National Register of Historic Places
Multiple Property Documentation Form

This form is used for documenting multiple property groups relating to one or several historic contexts. See instructions in *How to Complete the Multiple Property Documentation Form* (National Register Bulletin 16B). Complete each item by entering the requested information. For additional space, use continuation sheets (Form 10-900-a). Use a typewriter, word processor, or computer to complete all items.

New Submission Amended Submission

A. Name of Multiple Property Listing

Concrete in the Steel City: The Edison Concept Houses of Gary, Indiana

B. Associated Historic Contexts

The United States Sheet and Tin Plate Company Concrete Houses of Gary, Indiana, 1910-1957.

C. Form Prepared by

name/title Christopher Baas

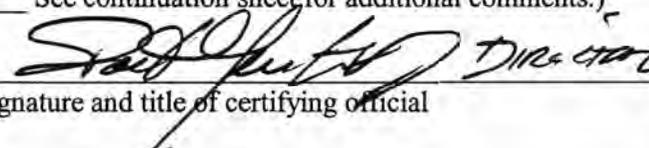
street & number 21116 North Banbury Road telephone (317)877-7799

city or town Noblesville state IN zip code 46062

D. Certification

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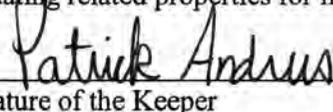
(See continuation sheet for additional comments.)


Signature and title of certifying official


Date

State or Federal Agency or Tribal government

I hereby certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.


Signature of the Keeper

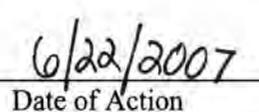

Date of Action

Table of Contents for Written Narrative

Provide the following information on continuation sheets. Cite the letter and the title before each section of the narrative. Assign page numbers according to the instructions for continuation sheets in *How to Complete the Multiple Property Documentation Form* (National Register Bulletin 16B). Fill in page numbers for each section in the space below.

	Page Number
E. Statement of Historic Contexts	3
F. Associated Property Types (Provide description, significance, and registration requirements.)	17
G. Geographical Data	18
H. Summary of Identification and Evaluation Methods (Discuss the methods used in developing the multiple property listing.)	18
I. Major Bibliographical References (List major written works and primary location of additional documentation: State Historic Preservation Office, other State agency, Federal agency, local government, university, or other, specifying repository.)	19

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E. Statement of Historic Contexts

The United States Sheet and Tin Plate Company Concrete Houses of Gary, Indiana, 1910-1957.

Introduction

In 1906, Gary, Indiana, was established to support U. S. Steel's grand industrial enterprise. Created from scratch, both the city and the mill were planned as complements. While the mill provided employment, the city was *planned* to provide the domestic necessities of dwelling and food, governance, and recreation. As soon as 1910, however, the city was incapable of meeting the housing demands brought by the expanding mills and the explosive population boom. As the *Gary Evening Post* reported, it was "not the bringing of more industries to Gary that is the great problem that is confronting us at the present time, but it is the housing of the men working in the industries we already have."¹

The steel company's solution was to construct houses to rent to their employees. In August 1910, the soon-to-open United States Sheet and Tin Plate Company subsidiary announced the construction of houses for its skilled employees. These dwellings incorporated the novel application of concrete as a building material for affordable houses, and a construction method invented, developed, and promoted by inventor Thomas Alva Edison and refined by Washington D.C. architect Milton Dana Morrill. Locally known as the Edison Houses, eighty-six terrace and detached dwellings were constructed between 1910 and 1913. Seventy-four remain. This multiple property document describes the historic context of these resources, the significance of the property type, and the requirements for National Register listing.

United States Steel and the Founding of Gary, Indiana

U.S. Steel was created in 1901 when Andrew Carnegie's steel interests merged with J.P. Morgan's. Already firmly established in the East, the company's interest in expanding into the Midwest began in 1905. After examining several sites in Illinois, Lake Michigan's Indiana shoreline was selected for its water access to iron ore freighters, and the country's rail network. The shoreline had never developed because its rolling and marshy dune-and-swale landscape made it unsuitable for farming. U.S. Steel used this blank slate to design Gary as a company town, but tried to avoid the disasters of previous industrial ventures in town building, with nearby Pullman, Illinois serving as the principal example. In laying out the city, the corporation assumed most all the lakefront south to the Grand Calumet River, leveled dunes, filled seven hundred feet of Lake Michigan, and channeled and relocated the river south. Adjacent to the main milling works, several U.S. Steel subsidiary companies constructed operations: the American Bridge Company, Universal Concrete Company, National Tube Company, American Locomotive Works, and the United States Sheet and Tin Plate Company. The latter manufactured corrosive-resistant tin-plated steel. Its opening was announced about 1909, and the facility opened for operations in June 1911.

The steel company's architects were proficient at planning a city that could be efficiently divided and liquidated for home construction. Laid out in a grid pattern, Broadway Avenue was constructed as the primary north-south artery, and Fifth Avenue the east-west. The Gary Land Company, another mill subsidiary, was organized to develop and liquidate mill-owned property. The First Subdivision—800 acres centered on Fifth and Broadway—was platted into 4000 residential lots, plus the core business and administrative districts. House lots typically measured 35x150 feet, and the Land Company provided paved streets and alleys, concrete sidewalks, and utilities. To prevent speculation, purchased lots had to be developed within eighteen months.

¹ *The Gary Evening Post*, June 12, 1912.

The city's private enterprise was simply unable to keep up with the mill's housing demands. In place of planned and controlled growth, the opening of a new plant or industry meant an instant population boom of thousands of workers. For instance, the 1911 startup of the tin mill and the bridge works saw the immediate influx of 3,000 men and their families. The 1912 opening of the Bolt and Screw Company instantly added 2,000.²

In 1910, The *Gary Evening Post* concluded there "would be five thousand more people in Gary today than we have, if there were enough houses to supply the demand at responsible and profitable rentals."³ Under a headline titled "Two Thousand Houses Will Not Fit Bill," the paper reported that even though the mill and its subsidiaries were providing housing for its employees, "the cry is for more houses to shelter the army of men and women who are coming to Gary." The Hunkeyville section of Gary was notorious for company-constructed, densely populated tenements, but workers and their families migrating from eastern mills did not want to live "like 'hunkies,' six to a bed."⁴ A July 1911 *Evening Post* editorial titled "Gary Is All Right" explained that employees were unable to obtain homes for their families, accounting "for the fact that the monthly payrolls are really larger than the amount of money placed into circulation [in Gary] would seem to indicate. Thousands of dollars are being sent back east every month by employees who are unable to bring their families here on account of the scarcity of houses."⁵ By 1912, the demand for housing became "so acute" that the Gary Commercial Club attempted to resolve the problem. Club President Watson reported "there are more than twenty-five hundred men who are employed here who live away from Gary simply because they are unable to find houses," and "the money spent away from here by the men who work in Gary and live elsewhere is a great loss to the merchants and other businessmen."⁶ The Commercial Club sought means to lower the prohibitive cost of constructing homes through refining the city's building requirements and developing local lending institutions.

In November 1910, the *Evening Post* described this frenzied atmosphere:

[The city is] certain to be the Mecca of many a varied and building concerns in the course of the next few years for the simple reason that Gary will be one of the great building centers in the country. About every concern with a new idea will want to secure an entrance into the local field. By making a real success here its national success will be assured for the eyes of the nation are going to be on Gary more in the coming years than they have been in the past. Gary has excited a good deal of interest up to the present because it has been regarded as an interesting experiment but as people understand that it has ceased to be in the experimental class, the city is going to bulk much larger in their eyes.⁷

This frantic demand for housing created an atmosphere of squalor, capitalism, and experimentation—each a different means to solve or profit from the problem. Initially, squatters' villages of tents and tin shacks housed workers in the First Subdivision, and in a rowdy area to its south known as The Patch. For a short time, the mill provided small, four-room houses that became overrun with lodgers in what was known as Hungary Row. A substantial district of multistory stone and brick apartment buildings was established on Fifth Avenue west of Broadway. Meanwhile, property owners of means constructed grand houses in revival styles, and citizens able to afford First Subdivision building costs erected Craftsman bungalows and small cottages. About 1916, Gary developer Ingwold Moe and insurance executive Wilbur Wynant constructed American System Built Houses, kit houses designed by Frank Lloyd Wright. Kit houses from Sears and similar companies were shipped to

² "The Number Will Be Increased to 20,000 Very Soon," *The Gary Evening Post*, February 21, 1911.

³ "The Gary Housing Problem," *The Gary Evening Post*, May 31, 1912.

⁴ *The Gary Evening Post*, August 30, 1910.

⁵ *The Gary Evening Post*, July 11, 1911.

⁶ *The Gary Evening Post*, June 6, 1912.

⁷ *The Gary Evening Post*, November 29, 1910.

Gary and erected by local contractors. With property sales and house construction lagging within the First Subdivision, the mill works and the American Bridge Company began constructing houses to rent to their employees. These Arts and Crafts style, single and duplex structures saved the mill money by using a standardized design of conventional wood-frame construction.

However, the Tin Plate Company ventured the most novel approach to the housing shortage. The company wanted to transfer management-level employees from its eastern mills to the Gary works, but could not house them and their families. Following the lead of the mill and the bridge company, the tin mill also constructed houses to rent to their employees. According to Graham Romeyn Taylor, the company chose the untested method of constructing concrete houses from reusable metal forms, to avoid the high, union inflated prices of wood construction. In a November 1910 article, titled "Tin Plate Houses Are Attracting Much Attention," the Evening Post reported:

Already one of the most interesting experiments in the way of building has been started in the new Tin Plate houses, a number of which are now being erected. These houses are to be built of concrete along the plan of Thomas Edison. The concrete is molded in steel forms, the whole form being set up before the pouring of the concrete starts. When the forms have been filled the concrete is given a few days to harden, then the forms are unbolted and removed and the walls of your house are completed. This method is a very rapid one and as the houses are said to be very substantial it is pretty certain to attain a large degree of popularity, especially in view of the fact that it is inexpensive. These new homes will attract a great deal of attention as they will be one of the first cases in which they have been built on a large order.⁸

The Rise of Concrete as a Construction Material:

Thomas Edison's Concept for a Solid Concrete Workingman's House

Concrete is a mixture of cement and aggregate, usually sand or stone, mixed with water. By 1900 it was already being used for breakwaters and piers, sidewalks, and house foundations.⁹ Its broad acceptance as a viable building material was a result of "reinforcement," the "perfection of means of giving masses of it," like in tunnels and bridges, "added strength by the introduction of iron rods."¹⁰ In 1908, *The Independent* heralded that "no product of the twentieth century is more characteristic of our type of civilization and of our progress in the economic arts than concrete, a composition of the cheapest and commonest materials to create the most substantial structures."¹¹ The *Boston Daily Globe* proclaimed that "we are soon to be living in what may be termed the concrete age,"¹² and that "wood, stone and brick have had their day, and concrete in various forms has become the most important building material of the times."¹³

About 1906, renowned celebrity inventor Thomas A. Edison (1847-1931) ventured into the public housing market with the novel idea for a method to produce affordable concrete houses for the working classes. Edison biographer Frank Lewis Dyer and architectural historian H. Ward Jandl describe this undertaking. Dyer explains that Edison entered the cement production business about 1901 by improving equipment used in manufacturing the product, resulting in the construction of a plant that was the nation's fifth largest by 1907.¹⁴ The inventor's interest in concrete houses came from both the business aspect of expanding the cement market,

⁸ *The Gary Evening Post*, November 29, 1910.

⁹ "Building of Concrete," *Boston Daily Globe*, September 24, 1908, from ProQuest Historical Newspapers.

¹⁰ "Concrete Houses From \$1000 Up," *Boston DailyGlobe*, January 26, 1908, from ProQuest Historical Newspapers.

¹¹ "Concrete," *The Independent*, April 29, 1909, from ProQuest Historical Newspapers.

¹² "Building of Concrete," *Boston Daily Globe*, September 24, 1908, from ProQuest Historical Newspapers.

¹³ "Concrete Houses From \$1000 Up," *Boston Daily Globe*, January 26, 1908, from ProQuest Historical Newspapers.

¹⁴ Dyer, *Edison: His Life and Inventions*, 507.

and the social aspect of providing affordable housing to the working class.¹⁵

Edison sought to quickly and efficiently cast a concrete residence in a single concrete pour. His patent application concisely describes his intent:

The object of my invention is to construct a building of a cement mixture by a single molding operation--all its parts, including the sides, roofs, partitions, bath tubs, floors, etc., being formed in an integral mass of a cement mixture. This invention is applicable to buildings of any sort, but I contemplate its use particularly for the construction of dwellings, in which the stairs, mantels, ornamental ceilings and other interior decorations and fixtures may be formed in the same molding operation and integral to the house itself. The house thus made is practically indestructible and is perfectly sanitary. The cost of its construction is low and it is feasible to beautify such a house far beyond anything now possible in so cheap a manner.¹⁶

While Edison anticipated company-supplied housing at “probably less than \$10 per month,” he truly desired a future of individual ownership. Dyer writes “Edison’s ideal house concept had been a broad one from the start,” and “those who care[d] to avail themselves of the privilege may, sooner or later, forsake the crowded apartment or tenement and be comfortably housed in sanitary, substantial, and roomy homes.”¹⁷

The popular press quickly latched onto Edison’s idea as a salvation for the working classes, and that a “large army of wage-earners may yet hail the concrete house as a blessing if all that is claimed for it comes to pass.”¹⁸ Journalist Ada May Krecker discussed Edison’s venture in her *Chicago Tribune* article titled “Seven Great Wonders of Science and Industry Perfected in 1907” which also included the dirigible airship, wireless transatlantic communication, and the *Lusitania*. Krecker proclaimed the “age of steel is passing and the age of concrete is dawning.”¹⁹ The *Boston Daily Globe*, predicting the demise of the stick-built residence, wrote that if Edison

has actually realized his dream of constructing separate concrete houses by the use of molds into which the cement mixture is poured, and if such can be built for \$1200 each, it will require a vigorous imagination to foresee all the benefits which his invention will confer upon the world. For Mr[.] Edison intends that the world shall reap the benefit, without being compelled to pay toll to any greedy corporation. There will be no monopoly in the Edison cement houses, once they are perfected.

That means, first, that the housing problem, which every year is becoming more serious on account of the diminishing supply of lumber and its steadily increasing price, will be solved. And, second, that the \$1200 cement house, waterproof and vermin proof, and requiring few if any repairs, will be far preferable to a wooden house costing five or six times more. Third, it means that hundreds of thousands of men and women wage earners throughout the country will be able to not only own their own homes, but to own homes that will not require constant repairing.²⁰

Edison, as quoted in the *Washington Post*, claimed there was “nothing novel” about his process, which was

¹⁵ Jandl, *Innovative American Homes: 1850-1950*, 69.

¹⁶ “Process for Constructing Concrete Buildings,” United States Patent Office, No. 1,219,272, filed August 13, 1908, granted March 3, 1917.

¹⁷ Dyer, *Edison: His Life and Inventions*, 525.

¹⁸ “Building of Concrete,” *Boston Daily Globe*, September 24, 1908, from ProQuest Historical Newspapers.

¹⁹ Ada May Krecker. “Seven Great Wonders of Science and Industry in 1907,” *Chicago Daily Tribune*, December 15, 1907, from ProQuest Historical Newspapers.

²⁰ “Edison’s Cement Houses,” *Boston Daily Globe*, May 21, 1910 from ProQuest Historical Newspapers.

similar to casting iron.²¹ He described his construction process as building a “complete double wall house” out of cast iron forms. The house was poured all at once with concrete from an elevator connected to a mixing hopper, delivered to “distribution pipes” at the top of the molds. Edison explains that the “best process for molding” is determined by the “hardening time of the cement,” the “rate of pouring this cement mixture,” and the “strength of the mold used.” His process required quick-drying concrete that acted as a base or “column” to support the concrete poured above, and that would quickly transpire water to relieve the wet cement’s hydraulic pressure, which could break the forms. Vents were strategically located in floors so that air could not cause unwanted voids in the finished concrete.

Edison held a separate patent for forms designed to be removed without injuring cast details. The rectangular molds were “preferably constructed of cast iron,” and consisted of metal panels attached to, and reinforced by, a frame constructed of metal angles. Architectural details like moldings and imprints were attached to the form’s interior at desired locations. Once the concrete hardened, the forms were removed and “used repeatedly for the construction of an indefinite number of houses.”²² The houses would “not resemble one another, like the peas in a pod, for the molds are adapted to many variations of arrangements, making it possible to change the style of houses with the same set of molds.”²³ Edison estimated the forms could be assembled in four days, the concrete poured in six hours and left to set for six days, and the forms removed in another four days. For an investment of \$175,000 for six molds, companies could construct 144 houses per year.²⁴

For Edison’s venture to succeed, concrete houses had to be affordable, and a desirable alternative to wood or brick. Edison’s market was “working people,” presumably of limited income and reliant upon tenements, who could rent company-supplied concrete houses “for \$10 or \$12 a month.”²⁵ The reported prices for these houses varied slightly among publications, but Edison claimed could be built for about \$1,200, plus the cost of the lot.²⁶ The *Chicago Daily Tribune* reported this amount to be “from a sixth to a fourth of what the average mechanic now pays for his home.” And, according to Edison, a wood-frame house averaged \$2,000 and a brick house \$3,000.²⁷

However, Edison’s plan was not without critics. In a particularly stinging commentary, *The Washington Post* portrayed the inventor as a huckster: “Tom is one of the most successful imitators that ever entertained a willing-to-be-humbugged public for his own profit. He is in a ten-acre lot all by himself and scratches his matches on the coattails of an admiring community.”²⁸ *The Independent* was more supportive, but printed in 1909 that perhaps the idea of affordable concrete housing was before its time because the cost of the molds would prohibit small-scale projects. The architecture would also “become monotonous, when fifty or one hundred buildings are molded in one pattern.” But *The Independent* also saw an advantage: “provided the molds were well conceived and educative to the common people,” it would do away with the monstrous and ludicrous in house building.²⁹ Some skeptics questioned Edison’s claim the structure’s \$1,200 cost was realistic after *The Globe*’s M. C. Tuttle reported that a precedent had not been “demonstrated to the building trade.” From a “contracting engineer’s point of view,” the forms needed to be used several times to recoup

²¹ *The Washington Post*, December 15, 1909, from ProQuest Historical Newspapers.

²² “Process for Constructing Concrete Buildings,” United States Patent Office, No. 1,219,272, filed August 13, 1908, granted March 3, 1917; “Mold for Concrete Construction,” United States Patent Office, No. 1,123,261, filed December 29, 1908, granted January 5, 1915.

²³ “Edison’s Cement Houses,” *Boston Daily Globe*, May 21, 1910, from ProQuest Historical Newspapers.

²⁴ Dyer, *Edison: His Life and Inventions*, 522.

²⁵ “Magazines,” *Zion’s Herald*, June 1, 1910, from ProQuest Historical Newspapers; Ada May Krecker, “Seven Great Wonders of Science and Industry in 1907,” *Chicago Daily Tribune*, December 15, 1907, from ProQuest Historical Newspapers.

²⁶ *The Washington Post*, December 15, 1909, from ProQuest Historical Newspapers.

²⁷ Ada May Krecker, “Seven Great Wonders of Science and Industry in 1907,” *Chicago Daily Tribune*, December 15, 1907, from ProQuest Historical Newspapers.

²⁸ “From the New York Press: New Building Materials,” *The Washington Post*, December 5, 1907 from ProQuest Historical Newspapers.

²⁹ “Concrete,” *The Independent*, April 29, 1909.

manufacturing cost. They must also be light-weight and portable enough “to produce the finished surfaces without bending or denting, or misusing them so that they would become unserviceable.”³⁰ If properly constructed, these homes could not cost less than a wood-frame house.³¹

Edison’s concrete prototype, designed by New York architects Mann & MacNeille in 1909, was “in the style of Francis I., richly decorated, with a cellar, three stories, and nine rooms.”³² Edison described it as “roomy, substantial, artistic . . . [and] with all modern conveniences,” and interior concrete “ornamentation” was cast at the time of pouring the house.³³ When Edison realized the Mann & MacNeille design was too elaborate for efficient construction, his own draftsmen planned a simpler structure in 1911. The cubicle, two-story, hipped-roof structure with a single-story porch was somewhat like an American Four-Square. Double brackets supported the roof’s deep overhang, and cast panels and ornamentation adorned the walls. Only promotional models were ever constructed.

Pittsburgh philanthropist Henry Phipps was reported to have met with Edison to discuss constructing “colonies” of 500 concrete houses near New York and Philadelphia to relieve families trapped in tenements. Rented at \$7.50 a month, the houses meant “longer lives for wasted little bodies and cramped, hungry souls, comfort and a taste of pleasure, and, above all, freedom.” Phipps was interested in a “one-piece,” “two-family” house, and Edison was to create molds during the winter of 1908 and construct a model house that spring.³⁴ However, Jandl concluded that it was not until 1912 that a concrete house “utilizing at least some of Edison’s ideas” was erected: Edison’s neighbor Frank D. Lambie constructed two, two-story houses in Montclair, New Jersey, incorporating multiple pours.³⁵ In 1915, Lambie’s associate Eli Hull, constructed eleven formed concrete houses in Newark, Ohio, on the “radical system of one complete story at one complete cast,” but without bolt holes, wires, or ties.³⁶

In 1911, Edison followed up his claim of making affordable concrete housing by announcing the availability of concrete furniture. Newlyweds could furnish their \$1,050 concrete house for half the cost of traditional furniture. Bedroom sets would cost as little as six dollars, and Edison even constructed a concrete phonograph cabinet.³⁷ Edison may have been making these outlandish claims to hype the Chicago Cement Show. However, *The New York Times* could not help making light of the idea by publishing McLandburgh Wilson’s “A Concrete Tale”:

He prinked himself with care
In beautiful array,
Then to her concrete house
He hid himself away.

Within her drawing room
Quite Prominent to view
A concrete sofa stood,
A perfect fit for two.

³⁰ M. C. Tuttle, “A Cement Houses NOT a Cheap House,” *Boston Daily Globe*, January 3, 1909, from ProQuest Historical Newspapers.

³¹ M. C. Tuttle, “The Truth About Concrete,” *Boston Daily Globe*, December 6, 1908, from ProQuest Historical Newspapers.

³² *The Washington Post*, December 15, 1909, from ProQuest Historical Newspapers.

³³ “Magazines,” *Zion’s Herald*, June 1, 1910, from ProQuest Historical Newspapers.

³⁴ “City of Concrete Planned,” *The Washington Post*, November 15, 1907; ‘To Abolish City Slums,’ *Los Angeles Times*, January 3, 1908, from ProQuest Historical Newspapers

³⁵ Jandl, *Innovative American Homes: 1850-1950*, 77.

³⁶ “Edison’s Associate Praises Eli Hull’s Building Methods,” *Newark Advocate*, June 12, 1915.

³⁷ *The Washington Post*, December 9, 1911, from ProQuest Historical Newspapers.

They talked of vine-clad cots
And every blissful thing,
Forth from his pocket then
He drew a concrete ring.

She saw no sparkling stone,
And gave a sudden start,
And very soon he found
She had a concrete heart.³⁸

The *Times* also suggested the possibility of concrete dogs to “stand warningly” in the front yard and concrete cats to “purr stonily under a concrete kitchen range.”³⁹

It is difficult to determine if Edison sparked a movement among architects and the construction industry to provide concrete houses for the public, or if he was simply shrewd enough to seize an opportunity ready to gain widespread acceptance. At the same time, others were also developing and constructing solid concrete structures like Edison, as well as structures of concrete block and prefabricated concrete walls. The press, however, credited Edison’s concept as the original.

Books and articles describing floor plans for concrete houses were popular *following* Edison’s announcement of his invention, but one is concurrent with it, demonstrating that others were actively using the product. As early as 1906, New York’s Atlas Portland Cement Company published a catalogue of concrete house plans “of several different systems of concrete construction.”⁴⁰ Titled *Concrete Country Residences*, it promoted the materials’ economic, comfort, and fire-resistant benefits. The catalog contains photos and floor plans for several monumental estates, and “Workingmen’s Houses” constructed of both solid concrete and concrete blocks.⁴¹ Atlas also published books on concrete factory construction, working man cottages, and farm structures.⁴² As early as 1907 the publication *Cement Age* printed concrete house plans “of a Moderate Cost” for a competition sponsored by the Association of American Portland Cement Manufacturers.⁴³

Shortly following Edison’s announcement, Boston architect H. W. Hathaway patented an “interlocking steel mold, built on the unit system” that could be “easily and quickly adjusted to any size building or any thickness of wall.” Hathaway “had [reportedly] anticipated” Edison’s concept and claimed he too could build a \$1,000 house, but conceded it would be a “modest affair, without heating apparatus, and with a minimum of plumbing and other luxuries.”⁴⁴ In 1908, a “model twentieth century home” of concrete blocks was constructed in Carrolton, Illinois.⁴⁵ In 1912 *The Spectator* wrote that Edison’s invention had not yet come to pass, but that others companies were actively constructing houses using wall molds.⁴⁶ Also in 1912, Oswald C. Hering assembled an “Illustrated Volume for the Laymen” titled *Concrete and Stucco Houses*. The catch-all book includes residential floor plans and methods of concrete construction.⁴⁷

In Gary, the Land Company was constructing concrete sidewalks in the First Addition, and Gary’s Neoclassical

³⁸ *The New York Times*, February 18, 1912, from ProQuest Historical Newspapers.

³⁹ *The New York Times*, December 9, 1911, from ProQuest Historical Newspapers.

⁴⁰ *Town and Country*, September 27, 1907, from ProQuest Historical Newspapers.

⁴¹ Hadley, Earl J. *The Magic Powder: History of the Universal Atlas Cement Company and the Cement Industry*, 142.

⁴² *The Atlanta Constitution*, August 31, 1908, from ProQuest Historical Newspapers.

⁴³ *The American Architect and Building News*, June 22, 1907, from ProQuest Historical Newspapers.

⁴⁴ “Concrete Houses From \$1000 Up,” *Boston Daily Globe*, January 26, 1908, from ProQuest Historical Newspapers.

⁴⁵ “Predicts the Ideal Home,” *The Washington Post*, November 15, 1908.

⁴⁶ “The Spectator,” *Outlook*, February 17, 1912, from ProQuest Historical Newspapers.

⁴⁷ “Book on Concrete Houses,” *The Washington Post*, May 26, 1912, from ProQuest Historical Newspapers.

Union Station was constructed of poured concrete in 1910. In an advertisement displaying a substantial American Four-Square, the Gary Concrete Company advocated constructing homes of concrete blocks to “save carpenter bills.”⁴⁸ In 1913, the Gary YMCA offered classes in concrete construction with time devoted to reinforced concrete construction.⁴⁹

Edison had, or at least seized, the grand idea for casting a concrete house. While he did attempt to resolve the inherent problems of casting a house in a single pour, it appears that others refined his concept to make it practical, and therefore marketable. The most notable was Washington D. C. architect Milton Dana Morrill, who won a gold medal in 1908 for designing a two-story “all-concrete sanitary workingman’s house” at the International Congress on Tuberculosis. The house’s sanitary aspect was important in industrial communities where renting and high occupation turnover were common. To clean a room, one only had to “remove the furniture and turn on the hose, there being plugged outlets at the corners for the water to run away.”⁵⁰

While inspired by Edison’s concept, Morrill found the reality of pouring a house in a single mold “impractical” because it required a “thin” concrete recipe with excessive amounts of water to reach all parts of a mold. Understanding that the thin mix would allow the aggregate to settle, he simplified the process by abandoning both Edison’s cumbersome attempt to pour the entire house at once, and the dependence on specialized concrete mixes for success. Morrill’s solution was a steel mold “consisting of a series of steel plates, or units, twenty-four inches square, easily interchangeable and adjustable.”⁵¹ The squares had flanged edges connected by “U” clips and steep wedges. The corner plates lapped to accommodate any size structure. A building could be poured one story at a time, or Morrill’s “swing-up” method could pour 24 inches at a time. Once a 24” lift was in place and had sufficiently cured, the form walls were flipped up to create a “trough” for another 24” pour.⁵² The method allowed a contractor to, in effect, walk the forms up a wall. Morrill’s house was purported to cost \$1,200, and a single set of forms could cast 1,000 houses.⁵³

Morrill apparently developed his forms shortly after, or as part of his gold medal house in Brentwood, Maryland. With a practical method that finally realized Edison’s hype, land developers and industries providing worker housing quickly put Morrill’s method to use. In 1910, investors promoted the construction of fireproof concrete houses designed by the architect for the Washington suburb of Virginia Highlands, a “model cement suburb city.”⁵⁴ In 1911 several projects used the forms. In May, an engineer representing the city of Budapest, Hungary, was in America observing the “best systems” for providing worker housing. Finding Edison’s concept “not matured,” he contracted with Morrill to construct 450 houses. In August, forty employee houses were planned for the anthracite mine at Nanticoke, Pennsylvania. The company constructed a railroad track around the development, mixed the concrete on a flatcar, and used a crane to hoist the product into place. In November, inspired by the success of the Virginia Highlands, 1,000 houses were planned for Queen’s Manor, New York.⁵⁵

Between 1910 and 1913, United States Steel’s subsidiary Sheet and Tin Plate Company apparently used the Morrill moulds to construct a collection of terrace and detached worker houses in Gary, Indiana.

⁴⁸ *Gary Daily Tribune*, May 1, 1909.

⁴⁹ *The Gary Evening Post*, October 31, 1913.

⁵⁰ “To Build Sanitary House,” *The Washington Post*, November 8, 1908, from ProQuest Historical Newspapers.

⁵¹ Arthur E. Ormes, “Unit Method of Concrete Building,” *Chicago Daily Tribune*, April 2, 1911, from ProQuest Historical Newspapers.

⁵² Milton Dana Morrill. *The Morrill Moulded Concrete Houses*, 16-17.

⁵³ Arthur E. Ormes, “Unit Method of Concrete Building,” *Chicago Daily Tribune*, April 2, 1911, from ProQuest Historical Newspapers.

⁵⁴ “For Fireproof Homes,” *The Washington Post*, January 2, 1910, from ProQuest Historical Newspapers; “To Pour 1,000 Houses,” *The Washington Post*, November 19, 1911, from ProQuest Historical Newspapers.

⁵⁵ “450 Poured Houses,” *The Washington Post*, May 14, 1911, from ProQuest Historical Newspapers; “Orders 40 Cement Houses,” *The Washington Post*, August 6, 1911, from ProQuest Historical Newspapers; “To Pour 1,000 Houses,” *The Washington Post*, November 19, 1911, from ProQuest Historical Newspapers.

The Construction of Gary's Edison Concept Houses

Aware that the task was somewhat of a spectacle, the press greeted the prospect of constructing concrete houses in Gary with great fanfare. The *Evening Post* proclaimed, "Gary can now be called the Concrete City as well as the Steel City."⁵⁶ A *Tribune* editorial titled "Gary to Be Mecca of Architects" concluded, the city "is indeed fortunate in being the scene of the first extensive building of concrete houses in the country." The paper explained how cement companies had been urging people to build with concrete, but consumers balked because the idea was too novel. Although Gary's Union Station, located where Broadway Avenue terminates at the mills, was touted as the best example of concrete construction in the state, only the Sheet and Tin Plate Company had "been brave enough to try" constructing concrete houses. The *Tribune* made "a safe prediction the Tin Plate houses will be inspected as generally as the mills by visitors next summer, who come for ideas in the new styles of architecture, with concrete as the basis."⁵⁷ In a related article titled "Gary Leads in Concrete Work," the *Tribune* reiterated that concrete house construction was making the city the "most advanced exponent of the art of concrete construction in the United States." Nowhere else in the country had attempted such a large concrete project. While Edison and the cement industry had presented concrete houses as the most "practicable" form of construction, "it remained for the tin plate company to adopt this new step in modern house construction and put its ideas into shape in the new city of Gary."⁵⁸ Their news also spread as far away as California, where *The Los Angeles Times* recorded that the houses were for "employees of the discriminating class."⁵⁹

The houses were constructed a few blocks from the mill in an undeveloped section of the First Subdivision, from Monroe to Polk Streets and 3rd to 5th Avenue. Although Gary had paved Fourth Avenue to the west, the area was still old dune unfavorably regarded as a "weary stretch" of "sandy waste"⁶⁰ Since the city's inception, the area had been known as Tent City, home to hundreds of immigrant squatters who had to be evicted for the new houses that were a "welcome break for the long stretch of sand in that neighborhood."⁶¹

D. F. Creighton, an architect from Ambridge, Pennsylvania employed by the subsidiary American Bridge Company, designed the houses. Creighton had already designed the bridge company's wood-frame employee housing, and his services were loaned to the tin plate company to complete a similar task. The *Tribune* lauded his plans, writing upon his application for the building permits that, having "abundant opportunities to show what can be done with this style of construction" he had not "neglected the opportunities." The houses were to be "ornamental to the city," and in "securing artistic effects [he had been] marvelously successful" at making the houses "one of the greatest attractions of the west side." His plans improved upon "ordinary house construction," and their varied style insured "an absence of monotony."⁶²

The buildings were erected by Pittsburgh contractor W. A. Songer who had worked with Creighton in Pennsylvania.⁶³ Songer was reportedly "one of the most prominent concrete operators in the East, having handled large contracts in Pennsylvania in that material," and was "appointed to the work in Gary because of his experience and advanced ideas in concrete construction." When asked if the concrete houses were an experiment, Songer replied, "no they are not—that is, not with Mr. Creighton and myself. We have done much of this work before, and satisfactorily. They are, however, somewhat of a new departure in concrete

⁵⁶ *The Gary Evening Post*, August 12, 1910.

⁵⁷ *The Gary Daily Tribune*, August 11, 1910.

⁵⁸ *The Gary Daily Tribune*, August 11, 1910.

⁵⁹ "Fact and Comment," *Los Angeles Times*, March 3, 1912, from ProQuest Historical Newspapers.

⁶⁰ *The Gary Evening Post*, August 12, 1910, and January 24, 1911.

⁶¹ *The Gary Evening Post*, May 4, 1910; August 12, 1910; and January 24, 1911.

⁶² *The Gary Daily Tribune*, May 6 and August 11, 1910.

⁶³ *The Gary Evening Post*, August 16, 1910.

construction.”⁶⁴

In his book *Satellite Cities: A Study of Industrial Suburbs*, Graham Romeyn Taylor writes that the experimental construction of Gary’s concrete houses was a risk the tin plate company accepted when they “found excessively high building costs” due to “high wage scale established by the building trade unions.” To affordably construct the houses, they had to devise a “scheme which, by the use of machinery, would reduce the labor factor to the smallest proportions.”⁶⁵ Although initial reports indicated the tin plate company would use union labor, the houses were built under an “open shop,” where membership was not required.⁶⁶

In August 1910, *The Tribune* explained that the forms were being “made up in the east” and would soon be delivered to Gary. To help offset their high costs, the company used cement “shipped in the car load” from U. S. Steel subsidiary Universal Portland Cement Company’s nearby Buffington plant.⁶⁷ The paper also described to the public—for the first time—how the houses would be constructed:

Under the new arrangement the steel form is set in place for the first story of the building. Through the top of the form a stream of mixed crushed stone and cement flows from the mixers. This form is allowed to stand until the liquid mass within solidifies and is capable of standing alone. When the concrete is dried sufficiently, the steel form is removed and the form for the second story goes into place on top of the concrete already in place.⁶⁸

Once the forms were stripped, an “additional outside dressing” was applied to give the structures a smooth finish and a uniform color.⁶⁹ The “new arrangement” likely refers to the departure from Edison’s proposed method of erecting a house in a single pour, towards more practical methods of pouring walls one story at a time. The *Tribune* article also describes various characteristics of a concrete house:

[The] window frames are of concrete and the door openings are ready to have jambs set for swinging the doors. Even the chimneys are molded of concrete and every bit of architectural effect is brought out in perfect form. Following the process the outside finishing touches are put on and the house stands a solid stone building with not a crack or crevice in it. As the years go by the substance becomes harder and harder. Even the porches are concrete and gutters and drains are molded by the forms in the same manner that doors and windows are outlined.⁷⁰

Unfortunately, Songer, only 45 years of age, died November 30, 1910, at his Tolleston home from a bout of typhoid fever complicated by pneumonia. The *Tribune* reported that Songer’s body was returned to Ambridge, with Creighton taking care of “all arrangements for the family.” Prior to Songer’s death, having found his health “precarious,” the tin plate company had appointed Chicago contractor Fred M. Stultz to assist in managing the project, and he assumed full control upon Songer’s passing.⁷¹

In January 1911, dynamite was used to excavate basement foundations for the “first batch” of thirty-six houses. The explosive “greatly decreases the labor used in the old method of shoveling out the dirt.”⁷² The event caused the *Post* to ponder that “there has been much said and written about these houses, the time for the beginning of

⁶⁴ *The Gary Daily Tribune*, August 11, 1910.

⁶⁵ Taylor, *Satellite Cities*, 186.

⁶⁶ Taylor, *Satellite Cities*, 184; *The Gary Daily Tribune*, August 11, 1910; *The Gary Evening Post*, March 15, 1911.

⁶⁷ *The Gary Daily Tribune*, August 11, 1910.

⁶⁸ *The Gary Daily Tribune*, August 11, 1910.

⁶⁹ *The Gary Daily Tribune*, July 2, 1911.

⁷⁰ *The Gary Daily Tribune*, August 11, 1910.

⁷¹ *The Gary Daily Tribune*, November 30 and December 1, 1910.

⁷² *The Gary Evening Post*, January 21, 1911. Note that no houses were constructed on Harrison Street.

construction has been predicted so often that it is really a relief to know that something definite is being done.”⁷³

With the foundations having been “done for some time,” work resumed in late April 1911.⁷⁴ However, another two months passed before anything resembling a house could be recognized. In early July, the *Post* reported work was proceeding slowly, and the *Tribune* finally announced success on July 2:

Forms were stripped from one of the concrete houses of the American Sheet & Tin Plate company at Fourth avenue and Harrison street yesterday for the first time and the officials of the company, who inspected the buildings after the forms were removed, are well pleased with the result of the first experiment. While there was some delay in starting the work, the progress being made now is highly satisfactory and it is believed that the buildings will be rushed to completion within a short time. It was only a week ago that the work got into full swing and remarkable progress has been made since that time.⁷⁵

The same report also explained, “the remainder of the buildings will go up rapidly,” and “although the construction [had] seemed slow, when a concrete house is up, it is much nearer completion than a brick or frame building.”⁷⁶ An order for additional houses was “countermanded” in the winter of 1911-12, but was resurrected in early June 1912. The *Tribune* reported that “although the foundations were in for two or three score more of the houses, nothing has been done with their construction” since progress was “stopped by winter last December.”⁷⁷

Each terrace contained a row of ten two-story houses with concrete foundations and walls, and wood-frame interior walls, floors, and roofs. The front facades had flat, somewhat stark surfaces with single-story, flat-roofed porches. The monotony of repetition was diminished by the use of parapet roofs of varying heights and shapes, and cast, geometric, tassel-like details unique to each structure. Buttress-like projections separated individual units. On the rear facade, each pair of houses was divided by small alcoves that provide windows to the units’ sides for light and ventilation. A coal chute was located under the front porch, and the basement had exterior access from the rear yard. Interior layouts mirrored adjacent units. The walls were constructed of plaster on woven lath, the floors of wood, and the interior woodwork in a restrained Arts & Crafts style. The first floor displayed a living room with a fireplace, a dining room with a small built-in shelf and cabinet, and a small kitchen with a door to the rear yard. A stairwell to the upper stories with a square newel post, handrail and spindles was located in the living room near the entry door. A skylight illuminated the well. The second and third story floor plans contained three bedrooms and a bathroom, assembled around the stairwell and a hall.

The two-story detached houses were of similar construction: concrete foundations and walls, and wood frame interior walls, floors, and roofs. Like the terraces, the walls were constructed of plaster on woven lath, the floors wood, and the interior woodwork in a restrained Arts & Crafts style. The front facades had single-story porches, and the rears had a single-story extension that housed the kitchen. The ground story plan consisted of a small entry foyer, a front parlor or living room, a dining room, and the kitchen. Unlike the terraces, the second story was accessed via enclosed stairs between the dining room and kitchen at the rear of the house. Like the terraces, the second story had three bedrooms and a bathroom clustered around the stairwell and a small hall.

⁷³ *The Gary Evening Post*, January 24, 1911. It is assumed that “block” means a terrace of ten houses.

⁷⁴ *The Gary Evening Post*, January 21, 1911; *The Gary Daily Tribune*, April 20, 1911. The author assumes from the report of thirty-six units being constructed that the six individual Polk Street houses (along with three ten-unit terrace structures), dating their construction to 1911.

⁷⁵ *The Gary Evening Post*, July 3, 1911; *The Gary Daily Tribune*, July 2, 1911.

⁷⁶ *The Gary Daily Tribune*, July 2, 1911.

⁷⁷ *The Gary Daily Tribune*, June 7, 1912.

The detached home at 612 Polk Street is the only known exception to all 86 houses. It was poured entirely of concrete, including interior floors and walls. Although purely speculation, perhaps this was the first house the tin plate company attempted to construct. Finding that framing and pouring horizontal floor slabs (required to support interior concrete walls) was too labor-intensive and costly, perhaps the architect altered his plans and constructed the interior with more traditional construction methods.

The number of houses reported planned for construction varied from 150 “concrete houses,” 210 “unique dwellings,” 250 “cement houses,” in 1910, and 100 “concrete houses” in 1912.⁷⁸ The 1915 Sanborn Insurance Maps illustrate that only 86 houses were constructed--six detached houses on Polk Street just south of 6th Avenue, and 80 terrace units on Polk, Van Buren, Jackson, and Monroe.⁷⁹ Newspaper accounts suggest the six detached Polk Street houses and some combination of three terraces at Polk or Harrison Streets were completed in 1911. Five additional blocks (50 houses) were completed by 1913.

The Demographic Makeup of the Edison Houses

In the brief span of fourteen years—1906 to 1920—Gary had become the state’s fourth most populated city behind Indianapolis, Fort Wayne, and Evansville. Mohl and Betten explain that Gary was a “city of steel and immigrants” that grew rapidly from a 1910 population of almost 17,000, “to fifty-five thousand in 1920 and over one hundred thousand in 1930.” Immigrant workers had predominated from the city’s start. By 1910 they comprised 70 percent of the city’s population, and by 1920 the foreign stock was still more than 60 percent. Immigrants came primarily from southern and Eastern Europe, the largest ethnic groups being “Poles, Slovaks, Serbians, Croatians, Italians, Greeks, Russians, and Hungarians.”⁸⁰ Public and charitable institutions assisted, organized, and in some instances helped assimilate the immigrant population. Froebel School, known as the immigrant school, provided instruction to both children and adults. The Carnegie Bailey Branch Library housed the International Institute in its basement.

A review of the 1920 population census, when the Tin Plate houses were about seven years old, illustrates that the majority of Gary’s population was between the ages of 20 and 44 years of age (50%), and predominantly male (57%). The city recorded approximately 12,000 “homes,” 63% rented, a percentage equal to Indianapolis, but notably higher than Fort Wayne (47%) and Evansville (58%), cities more representative of Gary’s size.⁸¹

The Tin Plate houses were built for and inhabited by “skilled workmen, mainly American.”⁸² The local paper described the Tin Plate employees as “good citizens” coming from the eastern mills with “pretty wives and lusty babies—lots of them.”⁸³ The 1920 census also provides a snapshot of who resided in the Tin Plate houses. Data located for 82 of the 86 houses represented 371 inhabitants: 151 men (40%), 100 women (27%), and 120 children (33%). Factoring in children, the houses resemble the male (53%) and female (47%) breakdown of Gary as a whole. Individual houses averaged 4.5 persons, the 404-422 Jackson Terrace with the least (2.8) and the Van Buren Terrace, operated like a boarding house, the most (8.6). Also consistent with Gary as a whole, the men’s average age was 33.5, the women’s 35.7, and the children’s 6.7. Nearly every house had a married couple (79 total couples in 82 houses), and, the Van Buren Terrace aside, houses mostly contained husband-wife-children family units. Husbands were almost two years older than wives (35.9 and

⁷⁸ *The Gary Evening Post*, August 12, 1910, August 22, 1910, and June 6, 1912; *Los Angeles Times*, August 27, 1910 from ProQuest Historical Newspapers. *The Gary Tribune*, August 11, 1910, and June 7, 1912.

⁷⁹ Sanborn Map Company, Maps for Gary, Indiana, 1915.

⁸⁰ Mohl and Betten, *Steel City*, 28.

⁸¹ Fourteenth Census of the United States: State Compendium Indiana, 1924. For comparison, Indiana’s foreign-born population, along with residents with at least one foreign-born parent, was 17.6%. It was 24% in Urban populations.

⁸² Taylor, *Satellite Cities*, 187.

⁸³ *The Gary Evening Post*, August 30, 1910.

34.1). Of the 120 children, 73 (63%) were daughters averaging about seven years of age, and 47 were sons, average 6.6. Records also show 61 lodgers (24% of all adults) also resided in 28 (34%) of the houses.

Only 38 (15%) of the adults were Hoosier-born. An equal number were Pennsylvania-born, since the mills recruited heavily in the company's home state. Eighty of the adult residents were foreign-born (32% of adults), and Greeks accounted for an overwhelming majority of foreign-born residents (37 or 46%), mostly single males residing in the Van Buren Terrace. Residents from Canada, England, Italy, and Rumania were also significantly represented.

The census recorded occupations representative of mill employment. Most heads-of-households were department foremen, although some were clerks, millwrights, and wage masters. A chef, a chief timekeeper, an accountant, and a chemist were also among the population. The lodgers, along with some heads-of-households, listed the blue-collar jobs of shearman, roller, cutter, heater, ruffer, or simply labor. None of the wives listed employment, and daughters and female lodgers who were employed listed the occupations of telephone operator, saleslady, and dime store pianist.

The over representation of low-wage foreign-born laborers was regarded as restricting the city's growth and was an issue the construction of the tin plate houses, along with other industry-sponsored housing, would begin to resolve. The tin plate company employed between six and seven thousand men, with a sizeable share "coming from the eastern tin plate mills." They were "skilled working men who receive high wages," a quality the local papers thought desirable for a city trying to establish local businesses but short on money flow.⁸⁴ Contrary to Edison's desire of providing housing for tenement-bound workers, the houses were constructed for the "chief workmen" needing living quarters while they prepared the plant for opening.⁸⁵

Exceeding Edison's 1910 goal of \$12 per month, 1915 rental costs for the houses ranged from \$20 for the two-story terraces, to \$27.50 for the three-story and detached houses. Yet, employees "eagerly rented the whole supply." Although Mohl and Betten concluded rents were excessive and caused families to take on borders to defray costs, they may have simply been using the opportunity to improve their own finances.⁸⁶

Conclusion

The Gary concrete houses were constructed for management-level employees, not the city's general labor populations. It is reasonable to question the association of Thomas Edison's name with these concrete houses, because the inventor was never successful in applying his method beyond the experimental stage, and no evidence suggests he had a dialog with the steel company to build concrete houses in Gary. The archivist for the Edison National Historic Site confirms they have no documentation of such communication, and believes it unlikely the inventor would have worked directly with the U.S. Sheet and Tin Plate Company.

An examination of the houses reveals a construction method consistent with another inventor's building techniques. The forms used for their construction incorporated 24" units which contemporary accounts attribute to the Morrill system. Accounts explain that the walls were poured one story at a time, not by Edison's proposed single pour. With the exception of the detached 612 Polk Street example, the flooring and roof systems incorporate traditional wood framing—wood joists supporting wood flooring or roof decking—not the all-concrete construction Edison described.

However, the press and public have, even to the present, associated concrete houses with Edison. Earl Hadley's *History of the Atlas Cement Company* (1945) concluded that Edison was generally credited with originating the

⁸⁴ *The Gary Evening Post*, June 13, 1911.

⁸⁵ *The Gary Evening Post*, January 24, 1911.

⁸⁶ Taylor, *Satellite Cities*, 187; Mohl and Betten, *Steel City* 15.

idea for the mass-produced concrete houses, although current research shows us that others, like Morrill and H. W. Hathaway, patented their own methods. Contemporary accounts recognized Edison and his concept for molding concrete dwellings when referencing the construction of the Gary houses. Under the heading “To Be Perfected by Tin Plate Co.,” *The Gary Daily Tribune* reported the idea for concrete houses “first came to be taken seriously when Thomas Edison, the inventor, perfected a concrete house model which he proposed to patent and rent for construction purposes. His idea was followed by others and the scheme for several years grew in new features and improvements, but [until Gary] no move was made to put the scheme to work on a large scale.” The tin plate company had tried to purchase the forms from “another company manufacturing them,” but when the firm could not meet the timeline, “patents were secured” and the forms were constructed in-house. Unfortunately, the paper does not print the name of the manufacturing company or patent owner.⁸⁷ *The Post* also identified the inventor as the Genesis of concrete house construction by reporting they were to be constructed “along the plans of Thomas Edison. The concrete is molded in steel forms, the whole form being set up before the pouring of the concrete starts.”⁸⁸ Taylor provides a post-construction summary of the tin plate houses, and concludes, “particular interest attaches to them in view of Mr. Edison’s enthusiastic predictions and the general impression that this is the coming method of supplying housing at a low cost for working people, especially when large numbers of houses are built at the same time and place.”⁸⁹ No direct contact between the mills and Edison has been established, although a 1914 newspaper account raises the possibility. *The Hartford Post* printed an article regarding A. C. Dunham’s dialogue with Edison about attaining molds to cast small farmhouses and barns, reporting that “new contracts have recently been announced by his [Edison’s] associate in this branch of the business.” An order by the Crucible Steel Company in Pittsburgh, includes an order for “300 more [houses] for a steel company in Gary, Ill [sic].” The report infers that Edison was selling molds, and that the Gary mill had contacted him and was planning “more” concrete houses. However, what is suspect is that the article is reporting information that would seem old news by 1914, and it misidentifies the city’s location. While the mill *could* have purchased molds for a new phase of construction that followed the initial 1910-1913 houses, no evidence shows they used them.⁹⁰

The tin plate company most likely used the Morrill method of construction. Accounts describing Morrill’s method mention Edison as originally developing the concept to pour concrete houses, and one account presents the idea that Morrill essentially just improved Edison’s existing concept. The Edison National Historic Site archives contain a letter by Morrill dated Nov 21, 1908, “expressing an interest in Edison’s cement house experiments and asking permission to visit Edison’s West Orange lab for a closer inspection. Morrill suggested Nov 28, 1908 [, and] Edison agreed to the visit in a marginal note and sent Morrill literature on the cement house.”⁹¹ The steel company and Morrill were both located in the east, and the company must have been aware of the architect’s success in designing sanitary worker housing. However, like contacts with Edison, no relationship between Morrill and the tin plate company has been identified, and it would be presumptive to credit the architect on the information available at this time.

Despite lack of evidence substantiating direct links to Edison or Morrill, the houses are symbolic of the city’s history, and their style, purpose, and novel construction method gives them statewide significance. Gary is Indiana’s example of the late nineteenth and early twentieth-century movement of creating towns specifically to support an individual company. The city was created from scratch, with no prior economy, history, or traditions. The tin plate houses are a direct result of the steel company overestimating the local economy’s willingness and ability to supply housing, even at a location of monumental demand. The choice to mass produce houses of concrete instead of wood or brick was the country’s initial large-scale experiment that finally

⁸⁷ *The Gary Daily Tribune*, August 11, 1910.

⁸⁸ *The Gary Evening Post*, November 29, 1910.

⁸⁹ Taylor, *Satellite Cities* 185.

⁹⁰ “A. C. Dunham Has Adopted Edison Concrete Structures for Newington Experiment,” *The Hartford Post*, May 15, 1914.

⁹¹ Email correspondence from archivist Leonard DeGraaf to the author, November, 13, 2006.

came to fruition after nearly a decade of promotion.

F. Associated Property Types

Description

There are three types of Edison Houses: two-story detached, two-story terrace, and three-story terrace. For the purpose of this document, the attached terraces constitute one property type and the detached houses another. The two-story detached houses are located at 604, 608, 612, and 614 Polk Street. The two-story terrace houses are located at 404-422 and 437-455 Polk Street, 304-318 and 408-416 Monroe Street, and 405-423 and 404-422 Jackson Street. The three-story terrace houses are at 338-352 Van Buren Street.

Single family detached: The single family detached houses are two stories tall, and have poured concrete foundations, poured concrete walls, and a flat roof. The interior structure may be constructed of poured concrete or wood joist floors with wood frame and plaster partition walls. Though each is on its own lot, their proximity, immediately neighboring each other, is conducive to a district nomination.

Terraces: The terraces are attached row houses. The surviving examples are mostly two stories high, but one is three stories in height. The exterior walls are poured concrete, and the interior structure is wood joist floor platforms and plaster-covered wood frame partition walls. Roofs are flat. The parapet treatment gives individuality to each unit, and provides a unifying element to the row. While each unit counts as a contributing building, nomination would be accomplished by listing constructed groups as a district.

Statement of Significance for single family and terrace houses

Gary's Edison Houses are eligible for the National Register under Criterion A as an example of the historic trends in the development and growth of the City of Gary. They represent a novel concept for house construction designed, patented, and promoted by inventor Thomas A. Edison, and refined by architect Milton Dana Morrill. Their construction was regarded as the country's first experiment in this type of large-scale housing production. Constructed for the employees of the U.S. Sheet and Tin Plate Company, they also represent one solution to the city's housing shortage caused by the influx of workers to the new mills.

The houses are eligible under Criterion C as outstanding examples of early twentieth-century company-supplied worker housing that utilized experimental methods and materials of house construction. The houses were designed by architect D. F. Creighton of Ambridge, Pennsylvania. Although the interior plans are identical among the housing types, they display simple, efficient, and homey spaces. The exterior use of cast details shows the architect's understanding of the need for variation to lessen the monotony of mass production.

Registration Requirements for single family and terrace houses

There are 86 concrete house contributing resources eligible for National Register listing in Gary. Since each house within a terrace has its own address and individual ownership, and the houses are too scattered to list in a single district nomination, they will be nominated in five separate district applications:

- The Polk Street detached houses will be listed as a district with four contributing resources.
- The terraces at 404-422 and 437-455 Polk Street will be a district nomination with twenty contributing resources.
- The terraces at 405-423 and 404-422 Jackson Street and 408-416 Monroe Street will be a district nomination of thirty contributing resources.
- The terraces at 304-318 Monroe Street will be a district nomination of nine contributing resources.
- The three-story terraces at 338-352 Van Buren Street will be a district nomination of ten contributing resources.

While this document presents the houses' historic context and significance, to be listed they must also have retained their integrity. The houses are currently in a variety of conditions that raise questions regarding their integrity. While many are individually owned by families who actively maintain the structures, just as many have been abandoned and are open to the elements or enclosed with plywood. In about 1995, approximately forty of the units were purchased by the not-for-profit Horace-Mann Neighborhood Association, which rehabilitated the interiors for affordable housing. This involved removing some interior historic materials and details.

To be eligible for listing, the houses, evaluated as a district, must display the integrity of design, location, setting, materials, workmanship, feeling, and association. Although some units have lost historic fabric, the houses' overall designs must be intact. The exterior appearance and interior spaces must represent the original designs and construction, the concrete building material must not be covered or altered, and a representative portion of the historic woodwork must remain. Porches can be enclosed, but should still appear as a porch. Each district cluster should have several intact and representative interiors. Representative interiors could include intact volume of primary living spaces, details such as fireplace mantels and stair railings, and other woodwork that might assist in defining "representative." A higher level of integrity will likely be encountered, and should be expected for the detached houses. Additional details such as intact moldings, fireplaces, overall floor plans, add to the level of integrity of the detached units. The buildings must be in their original location, and in a residential setting representative of the First Subdivision's streetscapes and housing. Historic materials must be represented to a degree that adequately illustrates the architect's design, especially the concrete walls and cast details, and to a lesser degree interior woodwork, plaster, and windows. The workmanship of the cast concrete exteriors and interior woodwork must be evident. Each district must retain the feeling of a residential area in an early twentieth-century industrial city.

G. Geographical Data

The resources associated with the historical context are located within a boundary formed by the following Gary, Indiana, streets: 3rd Avenue on the north, Monroe Street on the east, 7th avenue on the south, and Fillmore Street on the west.

H. Summary of Identification and Evaluation Methods

Several methods were used to identify and evaluate Gary's Edison Concept Houses. Microfilmed Gary newspapers provide reports, accounts, and opinions regarding the city's and the mill's growth. The construction of new buildings was news in a start-up community, especially news addressing the housing shortage that Gary initially experienced. Cover stories commonly reported news of industrial construction, and the building of, or lack of, houses and apartments.

Correspondence with Leonard DeGraaf, an archivist for the Edison National Historic Site, established doubt that Edison had a relationship with U.S. Steel. However, DeGraaf did confirm that architect Milton Dana Morrill likely visited the inventor in November 1908, shortly after winning the gold medal for his sanitary house of concrete design.

The on-line research engine ProQuest successfully identified newspaper reports, accounts of Edison's concept for providing affordable concrete dwellings, the growth of concrete as an accepted building material, and Milton Dana Morrill's advancement of Edison's concepts. Taylor's *Satellite Cities* (1915) provides a contemporary post-construction account of the houses and the only known historic photograph of the houses. The book presents a fascinating discussion on the dynamics of creating a city from scratch. Mohl and Betten's *Steel City* (1986) was an essential source for understanding Gary's evolution, and provides general demographic data and descriptions. The 1920 United States Census, the first reported following the houses'

construction, provides raw data about the families and individuals living in the houses. Sanborn Insurance maps help establish construction dates, locations, and the character of the city when the houses were constructed. Initial maps date to 1907, the year following Gary's founding. The 1915 update shows a growing city with the location of the terraced and detached houses, and also confirms that two individual Polk Street houses and a Monroe Street terrace of ten houses located no longer exist. The 1915 map also illustrates the lack of development in this section of the First Addition at the time the houses were constructed.

Photographs in the Calumet Archives photo illustrate the First Division's character. The archive contains historic photos of the city, its neighborhoods, and the construction of the mills. Several photos show houses and gardens neighboring the Edison houses. One photo, although presumably misidentified, shows the razed Monroe Street terrace in the background, one of only two historic photos that have been located.

The Pennsylvania SHPO, Pittsburgh Landmarks, Inc., and Athenaeum of Philadelphia were contacted regarding a precedent for terraced worker housing in that state, and for information regarding the architect Creighton. Unfortunately, they were unfamiliar with the term terrace housing "based on the Philadelphia plan" reported in one of the period Gary newspapers. Creighton was not an architect familiar to the groups, but a contact at Carnegie Mellon University, provided by Pittsburgh Landmarks, has expressed interest in pursuing additional research into his career.

In August 2006, several of the houses were examined, photo documented, and measured. This field work provided an understanding of how the houses were constructed, and developed the theory that concrete forms designed by Milton Dana Morrill were likely used to construct the Gary houses.

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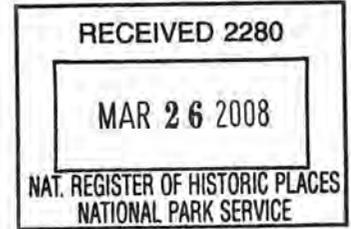
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Concrete in the Steel City: The Edison Concept Houses of Gary, Indiana

NPS Form 10-900-b
(Rev. Aug. 2002)

OMB No. 1024-0018
(Expires 1-31-2009)



United States Department of the Interior
National Park Service

National Register of Historic Places
Multiple Property Documentation Form

This form is used for documenting multiple property groups relating to one or several historic contexts. See instructions in *How to Complete the Multiple Property Documentation Form* (National Register Bulletin 16B). Complete each item by entering the requested information. For additional space, use continuation sheets (Form 10-900-a). Use a typewriter, word processor, or computer to complete all items.

New Submission Amended Submission

A. Name of Multiple Property Listing

Concrete in the Steel City: The Edison Concept Houses of Gary, Indiana

B. Associated Historic Contexts

The United States Sheet and Tin Plate Company Concrete Houses of Gary, Indiana, 1910-1957.

C. Form Prepared by

name/title Christopher Baas

street & number 21116 North Banbury Road telephone (317)877-7799

city or town Noblesville state IN zip code 46062

D. Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this documentation form meets the National Register documentation standards and sets forth requirements for the listing of related properties consistent with the National Register criteria. This submission meets the procedural and professional requirements set forth in 36 CFR Part 60 and the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation.
(See continuation sheet for additional comments.)

Signature and title of certifying official

Date

State or Federal Agency or Tribal government

I hereby certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.

for Colson H. Beall
Signature of the Keeper

5.8.08
Date of Action

Table of Contents for Written Narrative

Provide the following information on continuation sheets. Cite the letter and the title before each section of the narrative. Assign page numbers according to the instructions for continuation sheets in *How to Complete the Multiple Property Documentation Form* (National Register Bulletin 16B). Fill in page numbers for each section in the space below.

	Page Number
E. Statement of Historic Contexts	3
F. Associated Property Types (Provide description, significance, and registration requirements.)	16
G. Geographical Data	18
H. Summary of Identification and Evaluation Methods (Discuss the methods used in developing the multiple property listing.)	18
I. Major Bibliographical References (List major written works and primary location of additional documentation: State Historic Preservation Office, other State agency, Federal agency, local government, university, or other, specifying repository.)	19

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E. Statement of Historic Contexts

The United States Sheet and Tin Plate Company Concrete Houses of Gary, Indiana, 1910-1957.

Introduction

In 1906, Gary, Indiana, was established to support U. S. Steel's grand industrial enterprise. Created from scratch, both the city and the mill were planned as complements. While the mill provided employment, the city was *planned* to provide the domestic necessities of dwelling and food, governance, and recreation. As soon as 1910, however, the city was incapable of meeting the housing demands of the explosive population boom brought by the expanding mills. As the *Gary Evening Post* reported, it was "not the bringing of more industries to Gary that is the great problem that is confronting us at the present time, but it is the housing of the men working in the industries we already have."¹

The steel company's solution was to construct houses to rent to their employees. In August 1910, the soon-to-open United States Sheet and Tin Plate Company subsidiary announced the construction of houses for its skilled employees. These dwellings incorporated the novel application of concrete as a building material for affordable houses, and a construction method invented, developed, and promoted by inventor Thomas Alva Edison, but ultimately made feasible by others. Locally known as the Edison Houses, ninety-two concrete cottage, apartment, and terrace dwellings were constructed between 1910 and 1913. Seventy-three remain. This multiple property document describes the historic context of these resources, the significance of the property type, and the requirements for National Register listing.

United States Steel and the Founding of Gary, Indiana

U. S. Steel was created in 1901 when Andrew Carnegie's steel interests merged with J.P. Morgan's. Already firmly established in the East, the company's interest in expanding into the Midwest began in 1905. After examining several sites, Lake Michigan's Indiana shoreline was selected for its water access to iron ore freighters, and the country's rail network. The shoreline had never developed because its rolling and marshy dune-and-swale landscape made it unsuitable for farming. U.S. Steel used this blank slate to design Gary as a company town, but tried to avoid the disasters of previous industrial ventures in town building, with nearby Pullman, Illinois serving as the principal example. In laying out the city, the corporation assumed most all the lakefront south to the Grand Calumet River, leveled dunes, filled seven hundred feet of Lake Michigan, and channeled and relocated the river south. Adjacent to the main milling works, several U.S. Steel subsidiary companies constructed operations: the American Bridge Company, Universal Concrete Company, National Tube Company, American Locomotive Works, and the United States Sheet and Tin Plate Company. The latter manufactured corrosive-resistant tin-plated steel. Its opening was announced about 1909, and the facility started operations in June 1911.

The steel company's architects were proficient at planning a city that could be efficiently divided and liquidated for home construction. Laid out in a grid pattern, Broadway Avenue was constructed as the primary north-south artery, and Fifth Avenue the east-west. The Gary Land Company, another mill subsidiary, was organized to develop and liquidate mill-owned property. The First Subdivision—800 acres centered on Fifth and Broadway—was platted into 4,000 residential lots, plus the core business and administrative districts. House lots typically measured 35x150 feet, and the Land Company provided paved streets and alleys, concrete sidewalks, and utilities. To prevent speculation, purchased lots had to be developed within eighteen months.

¹ *The Gary Evening Post*, June 12, 1912.

Contrary to the steel company's expectations, the city's private enterprise was simply unable to keep up with the mill's housing demands. In place of planned and controlled growth, the opening of a new plant or industry meant an instant population boom of thousands of workers. For instance, the 1911 startup of the tin mill and the bridge works saw the immediate influx of 3,000 men and their families. The 1912 opening of the Bolt and Screw Company instantly added 2,000.²

In 1910, *The Gary Evening Post* concluded there "would be five thousand more people in Gary today than we have, if there were enough houses to supply the demand at responsible and profitable rentals."³ Under a headline titled "Two Thousand Houses Will Not Fit Bill," the paper reported that even though the mill and its subsidiaries were providing housing for its employees, "the cry is for more houses to shelter the army of men and women who are coming to Gary." That, workers and their families migrating from eastern mills did not want to live "like 'hunkies,' six to a bed," referring to Hunkeyville, a section of Gary that was notorious for company-constructed, densely populated tenements.⁴ A July 1911 *Evening Post* editorial titled "Gary Is All Right" explained that since employees were unable to obtain homes for their families the local economy suffered. This was supported by the "fact that the monthly payrolls are really larger than the amount of money placed into circulation [in Gary] would seem to indicate. Thousands of dollars are being sent back east every month by employees who are unable to bring their families here on account of the scarcity of houses."⁵ By 1912, the demand for housing became "so acute" that the Gary Commercial Club attempted to resolve the problem. Club President Watson reported "there are more than twenty-five hundred men who are employed here who live away from Gary simply because they are unable to find houses," and "the money spent away from here by the men who work in Gary and live elsewhere is a great loss to the merchants and other businessmen."⁶ The Commercial Club sought means to lower the prohibitive cost of constructing homes through refining the city's building requirements and developing local lending institutions.

This frantic demand for housing created an atmosphere of squalor, capitalism, and experimentation—each a different means to solve or profit from the problem. In November 1910, the *Evening Post* described this frenzied atmosphere:

[The city is] certain to be the Mecca of many a varied and building concerns in the course of the next few years for the simple reason that Gary will be one of the great building centers in the country. About every concern with a new idea will want to secure an entrance into the local field. By making a real success here its national success will be assured for the eyes of the nation are going to be on Gary more in the coming years than they have been in the past. Gary has excited a good deal of interest up to the present because it has been regarded as an interesting experiment but as people understand that it has ceased to be in the experimental class, the city is going to bulk much larger in their eyes.⁷

Initially, squatters' villages of tents and tin shacks housed workers in the First Subdivision, and in a rowdy area to its south known as The Patch. For a short time, the mill provided small, four-room houses that became overrun with lodgers in what was known as Hungary Row. A substantial district of multistory stone and brick apartment buildings was established on Fifth Avenue west of Broadway. Meanwhile, property owners of means constructed grand houses in revival styles, and citizens able to afford First Subdivision building costs erected Craftsman bungalows and small cottages. About 1916, Gary developer Ingwold Moe and insurance executive Wilbur Wynant constructed American System Built Houses, kit houses designed by Frank Lloyd

² "The Number Will Be Increased to 20,000 Very Soon," *The Gary Evening Post*, February 21, 1911.

³ "The Gary Housing Problem," *The Gary Evening Post*, May 31, 1912.

⁴ *The Gary Evening Post*, August 30, 1910.

⁵ *The Gary Evening Post*, July 11, 1911.

⁶ *The Gary Evening Post*, June 6, 1912.

⁷ *The Gary Evening Post*, November 29, 1910.

Wright. Kit houses from Sears and similar companies were shipped to Gary and erected by local contractors. With property sales and house construction lagging within the First Subdivision, the mill works and the American Bridge Company began constructing houses to rent to their employees. These Arts and Crafts style, single and duplex structures saved the mill money by using a standardized design of conventional wood-frame construction.

However, the Tin Plate Company ventured the most novel approach to the housing shortage. The company wanted to transfer management-level employees from its eastern mills to the Gary works, but could not house them and their families. Following the lead of the mill and the bridge company, the tin mill also constructed houses to rent to their employees. According to Chicago journalist Graham Romeyn Taylor, the company chose the untested method of constructing monolithic concrete houses from reusable metal forms, to avoid the high, union inflated prices of wood construction. In a November 1910 article, titled "Tin Plate Houses Are Attracting Much Attention," the *Evening Post* reported:

Already one of the most interesting experiments in the way of building has been started in the new Tin Plate houses, a number of which are now being erected. These houses are to be built of concrete along the plan of Thomas Edison. The concrete is molded in steel forms, the whole form being set up before the pouring of the concrete starts. When the forms have been filled the concrete is given a few days to harden, then the forms are unbolted and removed and the walls of your house are completed. This method is a very rapid one and as the houses are said to be very substantial it is pretty certain to attain a large degree of popularity, especially in view of the fact that it is inexpensive. These new homes will attract a great deal of attention as they will be one of the first cases in which they have been built on a large order.⁸

The Rise of Concrete as a Construction Material:

Thomas Edison's Concept for a Monolithic Concrete Workingman's House

Concrete is a mixture of cement and aggregate, usually sand or stone, mixed with water. By 1900 it was already being used for breakwaters and piers, sidewalks, and house foundations.⁹ Its broad acceptance as a viable building material was a result of "reinforcement," the "perfection of means of giving masses of it," like in tunnels and bridges, "added strength by the introduction of iron rods."¹⁰ In 1908, *The Independent* heralded that "no product of the twentieth century is more characteristic of our type of civilization and of our progress in the economic arts than concrete, a composition of the cheapest and commonest materials to create the most substantial structures."¹¹ The *Boston Daily Globe* proclaimed that "we are soon to be living in what may be termed the concrete age,"¹² and that "wood, stone and brick have had their day, and concrete in various forms has become the most important building material of the times."¹³

About 1906, renowned celebrity inventor Thomas A. Edison (1847-1931) ventured into the public housing market with the idea for a method to produce affordable concrete houses for the working classes. Edison biographer Frank Lewis Dyer and architectural historian H. Ward Jandl describe this undertaking. Dyer explains that Edison entered the cement production business about 1901 by improving equipment used in manufacturing the product, resulting in the construction of a plant that was the nation's fifth largest by 1907.¹⁴ The inventor's interest in concrete houses came from both the business aspect of expanding the cement market,

⁸ *The Gary Evening Post*, November 29, 1910.

⁹ "Building of Concrete," *Boston Daily Globe*, September 24, 1908, from ProQuest Historical Newspapers.

¹⁰ "Concrete Houses From \$1000 Up," *Boston DailyGlobe*, January 26, 1908, from ProQuest Historical Newspapers.

¹¹ "Concrete," *The Independent*, April 29, 1909, from ProQuest Historical Newspapers.

¹² "Building of Concrete," *Boston Daily Globe*, September 24, 1908, from ProQuest Historical Newspapers.

¹³ "Concrete Houses From \$1000 Up," *Boston Daily Globe*, January 26, 1908, from ProQuest Historical Newspapers.

¹⁴ Dyer, *Edison: His Life and Inventions*, 507.

and the social aspect of providing affordable housing to the working class.¹⁵

Edison sought to quickly and efficiently cast a concrete residence in a single concrete pour. His patent application concisely describes his intent:

The object of my invention is to construct a building of a cement mixture by a single molding operation--all its parts, including the sides, roofs, partitions, bath tubs, floors, etc., being formed in an integral mass of a cement mixture. This invention is applicable to buildings of any sort, but I contemplate its use particularly for the construction of dwellings, in which the stairs, mantels, ornamental ceilings and other interior decorations and fixtures may be formed in the same molding operation and integral to the house itself. The house thus made is practically indestructible and is perfectly sanitary. The cost of its construction is low and it is feasible to beautify such a house far beyond anything now possible in so cheap a manner.¹⁶

While Edison anticipated company-supplied housing at “probably less than \$10 per month,” he truly desired a future of individual ownership. Dyer writes “Edison’s ideal house concept had been a broad one from the start,” and “those who care[d] to avail themselves of the privilege may, sooner or later, forsake the crowded apartment or tenement and be comfortably housed in sanitary, substantial, and roomy homes.”¹⁷

The popular press quickly latched onto Edison’s idea as a salvation for the working classes, and that a “large army of wage-earners may yet hail the concrete house as a blessing if all that is claimed for it comes to pass.”¹⁸ Journalist Ada May Kreckler discussed Edison’s venture in her *Chicago Tribune* article titled “Seven Great Wonders of Science and Industry Perfected in 1907” which also included the dirigible airship, wireless transatlantic communication, and the *Lusitania*. Kreckler proclaimed the “age of steel is passing and the age of concrete is dawning.”¹⁹ The *Boston Daily Globe*, predicting the demise of the stick-built residence, wrote that if Edison

has actually realized his dream of constructing separate concrete houses by the use of molds into which the cement mixture is poured, and if such can be built for \$1200 each, it will require a vigorous imagination to foresee all the benefits which his invention will confer upon the world. For Mr[.] Edison intends that the world shall reap the benefit, without being compelled to pay toll to any greedy corporation. There will be no monopoly in the Edison cement houses, once they are perfected.

That means, first, that the housing problem, which every year is becoming more serious on account of the diminishing supply of lumber and its steadily increasing price, will be solved. And, second, that the \$1200 cement house, waterproof and vermin proof, and requiring few if any repairs, will be far preferable to a wooden house costing five or six times more. Third, it means that hundreds of thousands of men and women wage earners throughout the country will be able to not only own their own homes, but to own homes that will not require constant repairing.²⁰

Edison, as quoted in the *Washington Post*, claimed there was “nothing novel” about his process, which was

¹⁵ Jandl, *Innovative American Homes: 1850-1950*, 69.

¹⁶ “Process for Constructing Concrete Buildings,” United States Patent Office, No. 1,219,272, filed August 13, 1908, granted March 3, 1917.

¹⁷ Dyer, *Edison: His Life and Inventions*, 525.

¹⁸ “Building of Concrete,” *Boston Daily Globe*, September 24, 1908, from ProQuest Historical Newspapers.

¹⁹ Ada May Kreckler. “Seven Great Wonders of Science and Industry in 1907,” *Chicago Daily Tribune*, December 15, 1907, from ProQuest Historical Newspapers.

²⁰ “Edison’s Cement Houses,” *Boston Daily Globe*, May 21, 1910 from ProQuest Historical Newspapers.

similar to casting iron.²¹ He described his construction process as building a “complete double wall house” out of cast iron forms. The house was poured all at once with concrete from an elevator connected to a mixing hopper, delivered to “distribution pipes” at the top of the molds. Edison explains that the “best process for molding” is determined by the “hardening time of the cement,” the “rate of pouring this cement mixture,” and the “strength of the mold used.” His process required quick-drying concrete that acted as a base or “column” to support the concrete poured above, and that would quickly transpire water to relieve the wet cement’s hydraulic pressure, which could break the forms. Vents were strategically located in floors so that air could not cause unwanted voids in the finished concrete.

Edison held a separate patent for forms designed to be removed without injuring cast details. The rectangular molds were “preferably constructed of cast iron,” and consisted of metal panels attached to, and reinforced by, a frame constructed of metal angles. Architectural details like moldings and imprints were attached to the form’s interior at desired locations. Once the concrete hardened, the forms were removed and “used repeatedly for the construction of an indefinite number of houses.”²² The houses would “not resemble one another, like the peas in a pod, for the molds are adapted to many variations of arrangements, making it possible to change the style of houses with the same set of molds.”²³ Edison estimated the forms could be assembled in four days, the concrete poured in six hours and left to set for six days, and the forms removed in another four days. For an investment of \$175,000 for six molds, companies could construct 144 houses per year.²⁴

For Edison’s venture to succeed, concrete houses had to be affordable, and a desirable alternative to wood or brick. Edison’s market was “working people,” presumably of limited income and reliant upon tenements, who could rent company-supplied concrete houses “for \$10 or \$12 a month.”²⁵ The reported prices for these houses varied slightly among publications, but Edison claimed could be built for about \$1,200, plus the cost of the lot.²⁶ The *Chicago Daily Tribune* reported this amount to be “from a sixth to a fourth of what the average mechanic now pays for his home.” And, according to Edison, a wood-frame house averaged \$2,000 and a brick house \$3,000.²⁷

However, Edison’s plan was not without critics. In a particularly stinging commentary, *The Washington Post* portrayed the inventor as a huckster: “Tom is one of the most successful imitators that ever entertained a willing-to-be-humbugged public for his own profit. He is in a ten-acre lot all by himself and scratches his matches on the coattails of an admiring community.”²⁸ *The Independent* was more supportive, but printed in 1909 that perhaps the idea of affordable concrete housing was before its time because the cost of the molds would prohibit small-scale projects. The architecture would also “become monotonous, when fifty or one hundred buildings are molded in one pattern.” But *The Independent* also saw an advantage: “provided the molds were well conceived and educative to the common people,” it would do away with the “monstrous and ludicrous in house building.”²⁹ Some skeptics questioned Edison’s claim the structure’s \$1,200 cost was realistic after *The Globe*’s M. C. Tuttle reported that a precedent had not been “demonstrated to the building trade.” From a “contracting engineer’s point of view,” the forms needed to be used several times to recoup

²¹ *The Washington Post*, December 15, 1909, from ProQuest Historical Newspapers.

²² “Process for Constructing Concrete Buildings,” United States Patent Office, No. 1,219,272, filed August 13, 1908, granted March 3, 1917; “Mold for Concrete Construction,” United States Patent Office, No. 1,123,261, filed December 29, 1908, granted January 5, 1915.

²³ “Edison’s Cement Houses,” *Boston Daily Globe*, May 21, 1910, from ProQuest Historical Newspapers.

²⁴ Dyer, *Edison: His Life and Inventions*, 522.

²⁵ “Magazines,” *Zion’s Herald*, June 1, 1910, from ProQuest Historical Newspapers; Ada May Krecker, “Seven Great Wonders of Science and Industry in 1907,” *Chicago Daily Tribune*, December 15, 1907, from ProQuest Historical Newspapers.

²⁶ *The Washington Post*, December 15, 1909, from ProQuest Historical Newspapers.

²⁷ Ada May Krecker, “Seven Great Wonders of Science and Industry in 1907,” *Chicago Daily Tribune*, December 15, 1907, from ProQuest Historical Newspapers.

²⁸ “From the New York Press: New Building Materials,” *The Washington Post*, December 5, 1907 from ProQuest Historical Newspapers.

²⁹ “Concrete,” *The Independent*, April 29, 1909.

manufacturing cost. They must also be light-weight and portable enough “to produce the finished surfaces without bending or denting, or misusing them so that they would become unserviceable.”³⁰ If properly constructed, these homes could not cost less than a wood-frame house.³¹

Edison’s concrete prototype, designed by New York architects Mann & MacNeille in 1909, was “in the style of Francis I., richly decorated, with a cellar, three stories, and nine rooms.”³² Edison described it as “roomy, substantial, artistic . . . [and] with all modern conveniences,” and interior concrete “ornamentation” was cast at the time of pouring the house.³³ When Edison realized the Mann & MacNeille design was too elaborate for efficient construction, his own draftsmen planned a simpler structure in 1911. The cubicle, two-story, hipped-roof structure with a single-story porch was somewhat like an American Four-Square. Double brackets supported the roof’s deep overhang, and cast panels and ornamentation adorned the walls. Only promotional models were ever constructed.

Pittsburgh philanthropist Henry Phipps was reported to have met with Edison to discuss constructing “colonies” of 500 concrete houses near New York and Philadelphia to relieve families trapped in tenements. Rented at \$7.50 a month, the houses meant “longer lives for wasted little bodies and cramped, hungry souls, comfort and a taste of pleasure, and, above all, freedom.” Phipps was interested in a “one-piece,” “two-family” house, and Edison was to create molds during the winter of 1908 and construct a model house that spring.³⁴ However, Jandl concluded that it was not until 1912 that a concrete house “utilizing at least some of Edison’s ideas” was erected: Edison’s neighbor Frank D. Lambie constructed two, two-story houses in Montclair, New Jersey, incorporating multiple pours.³⁵ In 1915, Lambie’s associate Eli Hull, constructed eleven formed concrete houses in Newark, Ohio, on the “radical system of one complete story at one complete cast,” but without bolt holes, wires, or ties.³⁶ Lambie again attempted incorporating Edison’s concept when, in 1917, he planned to construct 40 houses at Union, New Jersey. Only eleven were completed.³⁷

In 1911, Edison followed up his claim of making affordable concrete housing by announcing the availability of concrete furniture. Newlyweds could furnish their \$1,050 concrete house for half the cost of traditional furniture. Bedroom sets would cost as little as six dollars, and Edison even constructed a concrete phonograph cabinet.³⁸ Edison may have been making these outlandish claims to hype the Chicago Cement Show. However, *The New York Times* could not help making light of the idea by publishing McLandburgh Wilson’s “A Concrete Tale”:

He prinked himself with care
In beautiful array,
Then to her concrete house
He hid himself away.

Within her drawing room
Quite Prominent to view
A concrete sofa stood,

³⁰ M. C. Tuttle, “A Cement Houses NOT a Cheap House,” *Boston Daily Globe*, January 3, 1909, from ProQuest Historical Newspapers.

³¹ M. C. Tuttle, “The Truth About Concrete,” *Boston Daily Globe*, December 6, 1908, from ProQuest Historical Newspapers.

³² *The Washington Post*, December 15, 1909, from ProQuest Historical Newspapers.

³³ “Magazines,” *Zion’s Herald*, June 1, 1910, from ProQuest Historical Newspapers.

³⁴ “City of Concrete Planned,” *The Washington Post*, November 15, 1907; “To Abolish City Slums,” *Los Angeles Times*, January 3, 1908, from ProQuest Historical Newspapers

³⁵ Jandl, *Innovative American Homes: 1850-1950*, 77.

³⁶ “Edison’s Associate Praises Eli Hull’s Building Methods,” *Newark Advocate*, June 12, 1915.

³⁷ Jandl, 79. These houses were also featured on PBS’ *History Detectives*.

³⁸ *The Washington Post*, December 9, 1911, from ProQuest Historical Newspapers.

A perfect fit for two.

They talked of vine-clad cots
And every blissful thing,
Forth from his pocket then
He drew a concrete ring.

She saw no sparkling stone,
And gave a sudden start,
And very soon he found
She had a concrete heart.³⁹

The *Times* also suggested the possibility of concrete dogs to “stand warningly” in the front yard and concrete cats to “purr stonily under a concrete kitchen range.”⁴⁰

It is difficult to determine if Edison sparked a movement among architects and the construction industry to provide concrete houses for the public, or if he was simply shrewd enough to seize an opportunity ready to gain widespread acceptance. As early as 1900, others were already developing and constructing solid concrete structures like Edison proposed, as well as structures of concrete block and prefabricated concrete walls. Brochures, books and articles describing floor plans for concrete houses were popular *prior* to Edison’s announcement of his invention. As early as 1906, New York’s Atlas Portland Cement Company published a catalogue of concrete house plans “of several different systems of concrete construction.”⁴¹ Titled *Concrete Country Residences*, it promoted the materials’ economic, comfort, and fire-resistant benefits. The catalog contains photos and floor plans for several monumental estates, and “Workingmen’s Houses” constructed of both solid concrete and concrete blocks.⁴² Atlas also published books on concrete factory construction, working man cottages, and farm structures.⁴³ As early as 1907 the publication *Cement Age* printed concrete house plans “of a Moderate Cost” for a competition sponsored by the Association of American Portland Cement Manufacturers.⁴⁴ Shortly following Edison’s announcement, Boston architect H. W. Hathaway patented an “interlocking steel mold, built on the unit system” that could be “easily and quickly adjusted to any size building or any thickness of wall.” Hathaway “had [reportedly] anticipated” Edison’s concept and claimed he too could build a \$1,000 house, but conceded it would be a “modest affair, without heating apparatus, and with a minimum of plumbing and other luxuries.”⁴⁵ In 1908, a “model twentieth century home” of concrete blocks was constructed in Carrolton, Illinois.⁴⁶ In 1912 *The Spectator* wrote that Edison’s invention had not yet come to pass, but that others companies were actively constructing houses using wall molds.⁴⁷ Also in 1912, Oswald C. Hering assembled an “Illustrated Volume for the Laymen” titled *Concrete and Stucco Houses*. The catch-all book includes residential floor plans and methods of concrete construction.⁴⁸ The press, however, credited Edison’s concept as the original.

In Gary, the Land Company was constructing concrete sidewalks in the First Addition, and Gary’s Neoclassical Union Station was constructed of poured concrete in 1910. In an advertisement displaying a substantial

³⁹ *The New York Times*, February 18, 1912, from ProQuest Historical Newspapers.

⁴⁰ *The New York Times*, December 9, 1911, from ProQuest Historical Newspapers.

⁴¹ *Town and Country*, September 27, 1907, from ProQuest Historical Newspapers.

⁴² Hadley, Earl J. *The Magic Powder: History of the Universal Atlas Cement Company and the Cement Industry*, 142.

⁴³ *The Atlanta Constitution*, August 31, 1908, from ProQuest Historical Newspapers.

⁴⁴ *The American Architect and Building News*, June 22, 1907, from ProQuest Historical Newspapers.

⁴⁵ “Concrete Houses From \$1000 Up,” *Boston Daily Globe*, January 26, 1908, from ProQuest Historical Newspapers.

⁴⁶ “Predicts the Ideal Home,” *The Washington Post*, November 15, 1908.

⁴⁷ “The Spectator,” *Outlook*, February 17, 1912, from ProQuest Historical Newspapers.

⁴⁸ “Book on Concrete Houses,” *The Washington Post*, May 26, 1912, from ProQuest Historical Newspapers.

American Four-Square, the Gary Concrete Company advocated constructing homes of concrete blocks to “save carpenter bills.”⁴⁹ In 1913, the Gary YMCA offered classes in concrete construction with time devoted to reinforced concrete construction.⁵⁰

Edison had, or at least seized, the grand idea for casting a concrete house. While he did attempt to resolve the inherent problems of casting a house in a single pour, it appears that others refined his concept to make it practical, and therefore marketable. Although it was published nearly a decade after the construction of the Gary houses, a 1920 article by *Concrete* magazine editor Harvey Whipple identified Milwaukee’s Reichert Metal Forms Company as the form manufacturer “for the big job at Gary.”⁵¹ Currently known as the Metal Forms Corporation, literature and photographs in the company’s archives confirm their connection to the project. An early Reichert sales brochure claimed that following an “exhaustive investigation, covering several months,” the Tin Plate Company “adopted” Reichert Forms “for the construction of some 200 monolithic and reinforced concrete dwellings, including both cottages and apartment houses, for its workingmen at Gary, Indiana. Cost being the deciding factor, the brochure explains the forms were selected because they combined the “greatest economy of both time and money.”⁵² Augustus F. Reichert was first successful producing molds to construct round concrete silos for rural farms. The double-wall, arced silo forms were easily transitioned to forming square walls and foundations. Wall forms were an assemblage of 24” square panels reinforced on the edges by a metal angle. For speed and ease of use, an important selling point, they were interconnected by a lever reminiscent of the closing hardware on a casement window. The double walls were held together by wood dowels that remained in the concrete. Very little is currently known about Reichert short of the incorporation of his business about 1910. His 1905 patent *grant* predates Edison’s *application* by two years, and the company was already producing “worker housing” by 1908.⁵³ Company brochures illustrate that the forms were widely used throughout the states and in foreign countries. Projects included houses, dairies, prisons, and even the famous columns of Frank Lloyd Wright’s Johnson Wax Building in nearby Racine.

It should be noted that a similar metal form had also been developed by architect Milton Dana Morrill, and was likely considered by the mill. The *Daily Tribune* reported the mill’s attempt to use forms from a company other than Reichert, but they could not be produced fast enough. Even then, the mill “secured” the Reichert patents and constructed the forms themselves. Although it is speculation by the author, Morrill tended to supervise projects himself, and the Tin Plate’s ability or desire to manage the project themselves may have been a factor in choosing the Reichert system. However, it could have just as easily have been cost and availability.⁵⁴

The Construction of Gary’s Edison Concept Houses

The Sheet and Tin Plate Mill announced it would provide homes for its employees in March of 1910, but news they would be constructed of concrete was not announced until mid-August.⁵⁵ Aware that the task was somewhat of a spectacle, the press greeted the prospect of constructing concrete houses in Gary with great fanfare. The *Evening Post* proclaimed, “Gary can now be called the Concrete City as well as the Steel City.”⁵⁶ A *Tribune* editorial titled “Gary to Be Mecca of Architects” concluded, the city “is indeed fortunate in being the scene of the first extensive building of concrete houses in the country.” The paper explained how cement companies had been urging people to build with concrete, but consumers balked because the idea was too novel. Although Gary’s Union Station, located where Broadway Avenue terminates at the mills, was touted as

⁴⁹ *Gary Daily Tribune*, May 1, 1909.

⁵⁰ *The Gary Evening Post*, October 31, 1913.

⁵¹ Whipple, 11.

⁵² Reichert Manufacturing Company (c.1911), 1. Taylor, 186.

⁵³ Atlas, 146.

⁵⁴ Whipple, 11.

⁵⁵ *The Gary Evening Post*, October March 12, 1910, *Gary Daily Tribune*, August 11, 1910.

⁵⁶ *The Gary Evening Post*, August 12, 1910.

the best example of concrete construction in the state, only the Sheet and Tin Plate Company had “been brave enough to try” constructing concrete houses. The *Tribune* made “a safe prediction the Tin Plate houses will be inspected as generally as the mills by visitors next summer, who come for ideas in the new styles of architecture, with concrete as the basis.”⁵⁷ In a related article titled “Gary Leads in Concrete Work,” the *Tribune* reiterated that concrete house construction was making the city the “most advanced exponent of the art of concrete construction in the United States.” Nowhere else in the country had attempted such a large concrete project. While Edison and the cement industry had presented concrete houses as the most “practicable” form of construction, “it remained for the tin plate company to adopt this new step in modern house construction and put its ideas into shape in the new city of Gary.”⁵⁸ Their news also spread as far away as California, where *The Los Angeles Times* recorded that the houses were for “employees of the discriminating class.”⁵⁹

The houses were constructed a few blocks from the mill in an undeveloped section of the First Subdivision, from Monroe to Polk Streets and 3rd to 5th Avenue. Although Gary had paved Fourth Avenue to the west, the area was still old dune unfavorably regarded as a “weary stretch” of “sandy waste”⁶⁰ Since the city’s inception, the area had been known as Tent City, home to hundreds of immigrant squatters who had to be evicted. The new houses were to be a “welcome break for the long stretch of sand in that neighborhood.”⁶¹

D. F. Creighton, an architect from Ambridge, Pennsylvania employed by the subsidiary American Bridge Company, designed the houses. Creighton had already designed the bridge company’s wood-frame employee housing, and his services were loaned to the tin plate company to complete a similar task. The *Tribune* lauded his plans, writing upon his application for the building permits that, having “abundant opportunities to show what can be done with this style of construction” he had not “neglected the opportunities.” The houses were to be “ornamental to the city,” and in “securing artistic effects [he had been] marvelously successful” at making the houses “one of the greatest attractions of the west side.” His plans improved upon “ordinary house construction,” and their varied style insured “an absence of monotony.”⁶²

The buildings were to be erected by Pittsburgh contractor W. A. Songer who had worked with Creighton in Pennsylvania.⁶³ Songer was reportedly “one of the most prominent concrete operators in the East, having handled large contracts in Pennsylvania in that material,” and was “appointed to the work in Gary because of his experience and advanced ideas in concrete construction.” When asked if the concrete houses were an experiment, Songer replied, “no they are not—that is, not with Mr. Creighton and myself. We have done much of this work before, and satisfactorily. They are, however, somewhat of a new departure in concrete construction.”⁶⁴

In his 1915 book *Satellite Cities: A Study of Industrial Suburbs*, Chicago journalist Graham Romeyn Taylor writes that the experimental construction of Gary’s concrete houses was a risk the tin plate company accepted when they “found excessively high building costs” due to “high wage scale established by the building trade unions.” To affordably construct the houses, they had to devise a “scheme which, by the use of machinery, would reduce the labor factor to the smallest proportions.”⁶⁵ This cost savings idea was also supported in the Reichert forms sales literature. Although initial reports indicated the tin plate company would use union labor,

⁵⁷ *The Gary Daily Tribune*, August 11, 1910.

⁵⁸ *The Gary Daily Tribune*, August 11, 1910.

⁵⁹ “Fact and Comment,” *Los Angeles Times*, March 3, 1912, from ProQuest Historical Newspapers.

⁶⁰ *The Gary Evening Post*, August 12, 1910, and January 24, 1911.

⁶¹ *The Gary Evening Post*, May 4, 1910; August 12, 1910; and January 24, 1911.

⁶² *The Gary Daily Tribune*, May 6 and August 11, 1910.

⁶³ *The Gary Evening Post*, August 16, 1910.

⁶⁴ *The Gary Daily Tribune*, August 11, 1910.

⁶⁵ Taylor, *Satellite Cities*, 186.

the houses were built under an “open shop,” where membership was not required.⁶⁶

To help offset their high costs, the company used cement “shipped in the car load” from U. S. Steel subsidiary Universal Portland Cement Company’s nearby Buffington plant.⁶⁷ The paper also described to the public—for the first time—how the houses would be constructed:

Under the new arrangement the steel form is set in place for the first story of the building. Through the top of the form a stream of mixed crushed stone and cement flows from the mixers. This form is allowed to stand until the liquid mass within solidifies and is capable of standing alone. When the concrete is dried sufficiently, the steel form is removed and the form for the second story goes into place on top of the concrete already in place.⁶⁸

Once the forms were stripped, an “additional outside dressing” was applied to give the structures a smooth finish and a uniform color.⁶⁹ The “new arrangement” likely refers to the departure from Edison’s proposed method of erecting a house in a single pour, towards more practical methods of pouring walls one story at a time. It might also refer to the use of metal over wood forms. The *Tribune* article also describes various characteristics of a concrete house:

[The] window frames are of concrete and the door openings are ready to have jambs set for swinging the doors. Even the chimneys are molded of concrete and every bit of architectural effect is brought out in perfect form. Following the process the outside finishing touches are put on and the house stands a solid stone building with not a crack or crevice in it. As the years go by the substance becomes harder and harder. Even the porches are concrete and gutters and drains are molded by the forms in the same manner that doors and windows are outlined.⁷⁰

Permits for the first six buildings—four apartments, an office for Songer, and a tool storage building—were secured in August with hopes of beginning the settlement before cold weather set in.⁷¹

Unfortunately, Songer, only 45 years of age, died November 30, 1910, at his Tolleston home from a bout of typhoid fever complicated by pneumonia. The *Tribune* reported that Songer’s body was returned to Ambridge, with Creighton taking care of “all arrangements for the family.” Prior to Songer’s death, having found his health “precarious,” the tin plate company had appointed Chicago contractor Fred M. Stultz to assist in managing the project, and he assumed full control upon Songer’s passing.⁷²

In January 1911, dynamite was used to excavate basement foundations for the “first batch” of thirty-six houses. The explosive “greatly decreases the labor used in the old method of shoveling out the dirt.”⁷³ The event caused the *Post* to ponder that “there has been much said and written about these houses, the time for the beginning of construction has been predicted so often that it is really a relief to know that something definite is being done.”⁷⁴

⁶⁶ Taylor, *Satellite Cities*, 184; *The Gary Daily Tribune*, August 11, 1910; *The Gary Evening Post*, March 15, 1911.

⁶⁷ *The Gary Daily Tribune*, August 11, 1910.

⁶⁸ *The Gary Daily Tribune*, August 11, 1910.

⁶⁹ *The Gary Daily Tribune*, July 2, 1911.

⁷⁰ *The Gary Daily Tribune*, August 11, 1910.

⁷¹ *The Gary Daily Tribune*, August 13, 1910.

⁷² *The Gary Daily Tribune*, November 30 and December 1, 1910.

⁷³ *The Gary Evening Post*, January 21, 1911.

⁷⁴ *The Gary Evening Post*, January 24, 1911. It is assumed that “block” means a terrace of ten houses.

With the foundations having been “done for some time,” work resumed in late April 1911.⁷⁵ However, another two months passed before anything resembling a house could be recognized. In early July, the *Post* reported work was proceeding slowly, and the *Tribune* finally announced success on July 2:

Forms were stripped from one of the concrete houses of the American Sheet & Tin Plate company at Fourth avenue and Harrison street yesterday for the first time and the officials of the company, who inspected the buildings after the forms were removed, are well pleased with the result of the first experiment. While there was some delay in starting the work, the progress being made now is highly satisfactory and it is believed that the buildings will be rushed to completion within a short time. It was only a week ago that the work got into full swing and remarkable progress has been made since that time.⁷⁶

The same report also explained, “the remainder of the buildings will go up rapidly,” and “although the construction [had] seemed slow, when a concrete house is up, it is much nearer completion than a brick or frame building.”⁷⁷ An order for additional houses was “countermanded” in the winter of 1911-12, but was resurrected in early June 1912. The *Tribune* reported that “although the foundations were in for two or three score more of the houses, nothing has been done with their construction” since progress was “stopped by winter last December.”⁷⁸

Each terrace contained a row of ten two or three-story houses with concrete foundations and walls, and wood-frame interior walls, floors, and roofs. The front facades had flat, somewhat stark surfaces with single-story, flat-roofed porches. The monotony of repetition was diminished by the use of parapet roofs of varying heights and shapes, and cast, geometric, tassel-like details unique to each structure. Buttress-like projections separated individual units. On the rear facade, each pair of houses was divided by small alcoves that provide windows to the units’ sides for light and ventilation. A coal chute was located under the front porch, and the basement had exterior access from the rear yard. Interior layouts mirrored adjacent units. The walls were finished in plaster on woven lath, the floors of wood, and the interior woodwork in a restrained Arts & Crafts style. The first floor displayed a living room with a fireplace, a dining room with a small built-in shelf and cabinet, and a small kitchen with a door to the rear yard. A stairwell to the upper stories with a square newel post, handrail and spindles was located in the living room near the entry door. A skylight illuminated the well. The second and third story floor plans contained three bedrooms and a bathroom, assembled around the stairwell and a hall.

The two-story cottages were of similar construction: concrete foundations and walls, and wood frame interior walls, floors, and roofs. Like the terraces, the walls were constructed of plaster on woven lath, the floors wood, and the interior woodwork in a restrained Arts & Crafts style. The front facades had single-story porches, and the rears had a single-story extension that housed the kitchen. The ground story plan consisted of a small entry foyer, a front parlor or living room, a dining room, and the kitchen. Unlike the terraces, the second story was accessed via enclosed stairs between the dining room and kitchen at the rear of the house. Like the terraces, the second story had three bedrooms and a bathroom clustered around the stairwell and a small hall.

The apartment buildings were two-story rectangular blocks that had flat roofs and basements. The interiors contained two one-bedroom flats, and two two-bedroom flats arranged around a central entry, hall, and stairwell. Each flat had a kitchen, pantry, bathroom, and living room. Sizable porches were located at both ends of the building. Unlike the cottages and terraces, the “plain and attractive” apartment displays subdued

⁷⁵ *The Gary Evening Post*, January 21, 1911; *The Gary Daily Tribune*, April 20, 1911. The author assumes from the report of thirty-six units being constructed, they included the six Polk Street cottages (along with three ten-unit terrace structures), dating their construction to 1911.

⁷⁶ *The Gary Evening Post*, July 3, 1911; *The Gary Daily Tribune*, July 2, 1911.

⁷⁷ *The Gary Daily Tribune*, July 2, 1911.

⁷⁸ *The Gary Daily Tribune*, June 7, 1912.

Colonial Revival elements such as a bracketed, open pediment above the primary entrance, and various panels. The interior details are consistent with the cottages and terraces.⁷⁹

The apartment buildings and the cottage at 612 Polk Street are the only dwellings constructed entirely of concrete (including interior floors and walls). Although purely speculation, Creighton may have found that forming and pouring horizontal floor slabs (that were also required to support interior concrete walls) was too labor-intensive and costly, and the architect altered his plans and constructed the interior of the subsequent houses using more traditional construction methods.

The number of houses reported planned for construction varied from 150 “concrete houses,” 210 “unique dwellings,” 250 “cement houses,” in 1910, and 100 “concrete houses” in 1912.⁸⁰ However, the 1915 Sanborn Insurance Maps illustrate that 92 dwellings were constructed. 6 apartment buildings of four flats each were constructed on 3rd, 4th, 6th Avenues. 6 cottages were constructed on Polk Street just south of 6th Avenue. 80 terrace units were constructed on Polk, Van Buren, Jackson, and Monroe.⁸¹ Newspaper accounts suggest the apartments, Polk Street cottages, and some combination of three terraces at Polk or Harrison Streets were completed in 1911. Five additional blocks (50 houses) were completed by 1913.

The Demographic Makeup of the Edison Terraces and Cottages

In the brief span of fourteen years—1906 to 1920—Gary had become the state’s fourth most populated city behind Indianapolis, Fort Wayne, and Evansville. Mohl and Betten explain that Gary was a “city of steel and immigrants” that grew rapidly from a 1910 population of almost 17,000, “to fifty-five thousand in 1920 and over one hundred thousand in 1930.” Immigrant workers had predominated from the city’s start. By 1910 they comprised 70 percent of the city’s population, and by 1920 the foreign stock was still more than 60 percent. Immigrants came primarily from southern and Eastern Europe, the largest ethnic groups being “Poles, Slovaks, Serbians, Croatians, Italians, Greeks, Russians, and Hungarians.”⁸² Public and charitable institutions assisted, organized, and in some instances helped assimilate the immigrant population. Froebel School, known as the immigrant school, provided instruction to both children and adults. The Carnegie funded Bailey Branch Library housed the International Institute in its basement.

A review of the 1920 population census, when the Tin Plate houses were about seven years old, illustrates that the majority of Gary’s population was between the ages of 20 and 44 years of age (50%), and predominantly male (57%). The city recorded approximately 12,000 “homes,” 63% rented, a percentage equal to Indianapolis, but notably higher than Fort Wayne (47%) and Evansville (58%), cities more representative of Gary’s size.⁸³

The Tin Plate houses were built for and inhabited by “skilled workmen, mainly American.”⁸⁴ The local paper described the Tin Plate employees as “good citizens” coming from the eastern mills with “pretty wives and lusty babies—lots of them.”⁸⁵ The 1920 census also provides a snapshot of who resided in the Tin Plate houses. Data located for 82 of the 86 houses represented 371 inhabitants: 151 men (40%), 100 women (27%), and 120 children (33%). Factoring in children, the houses resemble the male (53%) and female (47%) breakdown of Gary as a whole. Individual houses averaged 4.5 persons, the 404-422 Jackson Terrace with the least (2.8) and the Van Buren Terrace, operated like a boarding house, the most (8.6). However, since the

⁷⁹ *The Gary Tribune*, August 13, 1910.

⁸⁰ *The Gary Evening Post*, August 12, 1910, August 22, 1910, and June 6, 1912; *Los Angeles Times*, August 27, 1910 from ProQuest Historical Newspapers. *The Gary Tribune*, August 11, 1910, and June 7, 1912.

⁸¹ Sanborn Map Company, Maps for Gary, Indiana, 1915.

⁸² Mohl and Betten, *Steel City*, 28.

⁸³ Fourteenth Census of the United States: State Compendium Indiana, 1924. For comparison, Indiana’s foreign-born population, along with residents with at least one foreign-born parent, was 17.6%. It was 24% in Urban populations.

⁸⁴ Taylor, *Satellite Cities*, 187.

⁸⁵ *The Gary Evening Post*, August 30, 1910.

number of bedrooms varied among the houses (anywhere from 2 to 6), a better measure is individuals per bedroom. This measurement indicates that the 304-322 Monroe two-bedroom terraces housed the most people at 2.2 per bedroom, and the Polk Street cottages the least at 1.4 per bedroom (almost identical to the Van Buren Terrace).

Also consistent with Gary as a whole, the men's average age was 33.5, the women's 35.7, and the children's 6.7. Nearly every house had a married couple (79 total couples in 82 houses), and, the Van Buren Terrace aside, houses mostly contained husband-wife-children family units. Husbands were almost two years older than wives (35.9 and 34.1). Of the 120 children, 73 (63%) were daughters averaging about seven years of age, and 47 were sons, average 6.6. Records also show 61 lodgers (24% of all adults) also resided in 28 (34%) of the houses.

Only 38 (15%) of the adults were Hoosier-born. An equal number were Pennsylvania-born, since the mills recruited heavily in the company's home state. Eighty of the adult residents were foreign-born (32% of adults), and Greeks accounted for an overwhelming majority of foreign-born residents (37 or 46%), mostly single males residing in the Van Buren Terrace. Residents from Canada, England, Italy, and Rumania were also significantly represented.

The census recorded occupations representative of mill employment. Most heads-of-households were department foremen, although some were clerks, millwrights, and wage masters. A chef, a chief timekeeper, an accountant, and a chemist were also among the population. The lodgers, along with some heads-of-households, listed the blue-collar jobs of shearman, roller, cutter, heater, ruffer, or simply labor. None of the wives listed employment, and daughters and female lodgers who were employed listed the occupations of telephone operator, saleslady, and dime store pianist.

The over representation of low-wage foreign-born laborers was regarded as restricting the city's growth and was an issue the construction of the tin plate houses, along with other industry-sponsored housing, would begin to resolve. The tin plate company employed between six and seven thousand men, with a sizeable share "coming from the eastern tin plate mills." They were "skilled working men who receive high wages," a quality the local papers thought desirable for a city trying to establish local businesses but short on money flow.⁸⁶ Contrary to Edison's desire of providing housing for tenement-bound workers, the houses were constructed for the "chief workmen" needing living quarters while they prepared the plant for opening.⁸⁷

Exceeding Edison's 1910 goal of \$12 per month, 1915 rental costs for the houses ranged from \$20 for the two-story terraces, to \$27.50 for the three-story and detached houses. Yet, employees "eagerly rented the whole supply." Although Mohl and Betten concluded rents were excessive and caused families to take on borders to defray costs, they may have simply been using the opportunity to improve their own finances.⁸⁸

Conclusion

Beginning in 1910, the United State Sheet and Tin Plate Company began implementing Thomas Edison's concept of providing worker housing constructed of formed concrete. It is reasonable to question the association of Thomas Edison's name with these concrete houses, because the inventor was never successful in applying his method beyond the experimental stage, and no evidence suggests he had a dialog with the steel company to build concrete houses in Gary. The archivist for the Edison National Historic Site confirms they have no documentation of such communication, and believes it unlikely the inventor would have worked directly with the U.S. Sheet and Tin Plate Company. Additionally, we know the Reichert Metal Forms

⁸⁶ *The Gary Evening Post*, June 13, 1911.

⁸⁷ *The Gary Evening Post*, January 24, 1911.

⁸⁸ Taylor, *Satellite Cities*, 187; Mohl and Betten, *Steel City* 15.

Corporation supplied the forms for the Gary houses, that Reichert was *manufacturing* forms for houses and silos before, or about the time, Edison began promoting his concept in 1906, and no relationship between Reichert and Edison has been identified.

However, the press and public have, even to the present, associated concrete houses with Edison. Earl Hadley's *History of the Atlas Cement Company* (1945) concluded that Edison was generally credited with originating the idea for mass-produced monolithic concrete houses, although current research shows us that others, like Reichert, Morrill, and H. W. Hathaway, patented their own methods. Accounts contemporary to the house's construction recognized Edison and his concept for molding concrete dwellings when referencing the construction of the Gary houses. Under the heading "To Be Perfected by Tin Plate Co.," *The Gary Daily Tribune* reported the idea for concrete houses "first came to be taken seriously when Thomas Edison, the inventor, perfected a concrete house model which he proposed to patent and rent for construction purposes. His idea was followed by others and the scheme for several years grew in new features and improvements, but [until Gary] no move was made to put the scheme to work on a large scale." *The Post* also identified the inventor as the Genesis of concrete house construction by reporting they were to be "along the plans of Thomas Edison. The concrete is molded in steel forms, the whole form being set up before the pouring of the concrete starts."⁸⁹ Taylor provides a post-construction summary of the tin plate houses, and concludes, "particular interest attaches to them in view of Mr. Edison's enthusiastic predictions and the general impression that this is the coming method of supplying housing at a low cost for working people, especially when large numbers of houses are built at the same time and place."⁹⁰

Despite lack of evidence substantiating *direct* links to Edison, the houses are symbolic of the city's history, and their style, purpose, and novel construction method gives them statewide significance. Gary is Indiana's example of the late nineteenth and early twentieth-century movement of creating towns specifically to support an individual company. The city was created from scratch, with no prior economy, history, or traditions. The tin plate houses are a direct result of the steel company overestimating the local economy's willingness and ability to supply housing, even at a location of monumental demand. The choice to mass produce houses of concrete instead of wood or brick was the country's initial large-scale experiment that finally came to fruition after nearly a decade of promotion.

F. Associated Property Types

Description

There are three types of Edison resources: cottages, terraces, and an apartment building. For the purpose of this document, the cottages constitute a property type, the attached terraces constitute a property type, and the apartment constitutes a property type. The two-story cottages are located at 604, 608, 612, and 614 Polk Street. The two-story terrace houses are located at 404-422 and 437-455 Polk Street, 304-320 and 408-426 Monroe Street, and 405-423 and 404-422 Jackson Street. The three-story terrace houses are at 338-352 Van Buren Street. The remaining two-story flat is located at 633 West 4th Avenue.

Single family cottages: The single family detached houses are two stories tall, and have formed concrete foundations and walls, and a flat roof. The interior structure may be constructed of poured concrete or wood joist floors, with wood frame and plaster partition walls. Though each is on its own lot, their proximity, immediately neighboring each other, is conducive to a district nomination.

Terraces: The terraces are attached row houses in sets of ten. The set of ten houses may be made entirely of two bedrooms, or entirely of three bedrooms. The surviving examples are two stories, except for one terrace

⁸⁹ *The Gary Evening Post*, November 29, 1910.

⁹⁰ Taylor, *Satellite Cities* 185.

that is three stories in height. The exterior walls are poured concrete, and the interior structure is wood joist floor platforms and plaster-covered wood frame partition walls. Roofs are flat. The parapet treatment gives individuality to each unit, and provides a unifying element to the row. While each unit counts as a contributing building, nomination would be accomplished by listing constructed groups as a district.

Apartment Building: The loan remaining flat is the last example of the six that were constructed. It is two-stories in height and has four apartments. The walls, floors, and roof are formed concrete. The roof is flat, and each unit has a porch. The building's association with the cottage and terrace concrete resources, location, unique plan, and form makes it eligible for individual listing.

Statement of Significance for single family cottages, terrace houses and flats

Gary's Edison Houses are eligible for the National Register under Criterion A as an example of the historic trends in the development and growth of the City of Gary. They represent a novel concept for house construction designed, patented, and promoted by inventor Thomas A. Edison, and refined by various architects and form manufacturers. Their construction was regarded by journalists as the country's first experiment in this type of large-scale, mass produced housing production. Constructed for the employees of the U.S. Sheet and Tin Plate Company, they also represent one solution to the city's housing shortage caused by the influx of workers to Gary's new mills.

The houses are eligible under Criterion C as outstanding examples of early twentieth-century company-supplied worker housing that utilized experimental methods and materials for house construction. The houses were designed by architect D. F. Creighton of Ambridge, Pennsylvania. They incorporated metal forms supplied by Milwaukee's Reichert Manufacturing Company. While the interior plans and details are nearly identical among the building types, they display simple, efficient, and homey spaces. The exterior use of cast details shows the architect's understanding of the need for variation to lessen the monotony of mass production.

Registration Requirements for single family cottages, terrace houses, and four-unit flat building

There are 73 concrete resources eligible for National Register listing in Gary. The four-unit flat building is distinct in form and layout from the cottage and terrace resources, and will be listed individually. Since each cottage, and individual house within a terrace, has its own address and individual ownership, and the houses are too scattered to list in a single district nomination, they will be nominated in five separate district applications:

- The Polk Street detached houses will be listed as a district with four contributing resources.
- The terraces at 404-422 and 437-455 Polk Street will be a district nomination with twenty contributing resources.
- The terraces at 405-423 and 404-422 Jackson Street and 408-426 Monroe Street will be a district nomination of thirty contributing resources.
- The terraces at 304-318 Monroe Street will be a district nomination of eight contributing resources.
- The three-story terraces at 338-352 Van Buren Street will be a district nomination of ten contributing resources.

While this document presents the resources' historic context and significance, to be listed they must also have retained their integrity. The resources are currently in a variety of conditions that raise questions regarding their integrity. While many are individually owned by families who actively maintain the structures, just as many have been abandoned and are open to the elements or enclosed with plywood. In about 1995, approximately forty of the units were purchased by the not-for-profit Horace-Mann Neighborhood Association, which rehabilitated the interiors for affordable housing. This involved removing some interior historic materials and details.

To be eligible for listing, the four-flat apartment building must individually display the integrity of design, location, setting, materials, workmanship, feeling, and association. The building's overall design must be intact. The exterior appearance and interior spaces must represent original design and construction, the concrete building material must not be covered or altered, and a representative portion of the historic woodwork must remain. Porches can be enclosed, but should still appear as a porch. Representative interiors could include intact volume of primary living spaces, details such as woodwork and other materials that might assist in defining "representative." The apartment must be in its original location, and in a setting representative of the First Subdivision's streetscapes and housing. Historic materials must be represented to a degree that adequately illustrates the architect's design, especially the concrete walls and cast details, and interior woodwork, plaster, and windows. The workmanship of the cast concrete exteriors and interior woodwork must be evident. Each district must retain the feeling of a residential area in an early twentieth-century industrial city.

To be eligible for listing, the cottage and terrace resources, evaluated as a district, must display the integrity of design, location, setting, materials, workmanship, feeling, and association. Although some units have lost historic fabric, the houses' overall designs must be intact. The exterior appearance and interior spaces must represent the original designs and construction, the concrete building material must not be covered or altered, and a representative portion of the historic woodwork must remain. Porches can be enclosed, but should still appear as a porch. Each district cluster should have several intact and representative interiors. Representative interiors could include intact volume of primary living spaces, details such as fireplace mantels and stair railings, and other woodwork that might assist in defining "representative." A higher level of integrity will likely be encountered, and should be expected for the detached houses. Additional details such as intact moldings, fireplaces, overall floor plans, add to the level of integrity of the detached units. The buildings must be in their original location, and in a residential setting representative of the First Subdivision's streetscapes and housing. Historic materials must be represented to a degree that adequately illustrates the architect's design, especially the concrete walls and cast details, and to a lesser degree interior woodwork, plaster, and windows. The workmanship of the cast concrete exteriors and interior woodwork must be evident. Each district must retain the feeling of a residential area in an early twentieth-century industrial city.

G. Geographical Data

The resources associated with the historical context are located within a boundary formed by the following Gary, Indiana, streets: 3rd Avenue on the north, Monroe Street on the east, 7th avenue on the south, and Fillmore Street on the west.

H. Summary of Identification and Evaluation Methods

Several methods were used to identify and evaluate Gary's Edison Concept Houses. Microfilmed Gary newspapers provide reports, accounts, and opinions regarding the city's and the mill's growth. The construction of new buildings was news in a start-up community, especially news addressing the housing shortage that Gary initially experienced. Cover stories commonly reported news of industrial construction, and the building of, or lack of, houses and apartments.

The discovery of a 1920 article written for *Concrete* magazine tied the Gary houses to Milwaukee's Metal Forms Corporation, a company still in business. The owner, Tom Miller, made the company's archives available for this project. Several historic photographs of the cottages and apartments were made available for study, and company brochures provided a description of the mill's search for an affordable form.

Correspondence with Leonard DeGraaf, an archivist for the Edison National Historic Site, established doubt that Edison had a direct relationship with U.S. Steel.

The on-line research engine ProQuest successfully identified newspaper reports, accounts of Edison's concept for providing affordable concrete dwellings, the growth of concrete as an accepted building material, and various architects and form manufacturer's advancement of Edison's concepts. Taylor's *Satellite Cities* (1915) provides a contemporary, post-construction account of the houses and the only known historic photograph of the houses. The book presents a fascinating discussion on the dynamics of creating a city from scratch. Mohl and Betten's *Steel City* (1986) was an essential source for understanding Gary's evolution, and provides general demographic data and descriptions. The 1920 United States Census, the first reported following the houses' construction, provides raw data about the families and individuals living in the houses. Sanborn Insurance maps help establish construction dates, locations, and the character of the city when the houses were constructed. Initial maps date to 1907, the year following Gary's founding. The 1915 update shows a growing city with the location of the terraced and detached houses, and also confirms that two individual Polk Street houses and a Monroe Street terrace of ten houses located no longer exist. The 1915 map also illustrates the lack of development in this section of the First Addition at the time the houses were constructed.

Photographs in the Calumet Archives photo illustrate the First Division's character. The archive contains historic photos of the city, its neighborhoods, and the construction of the mills. Several photos show houses and gardens neighboring the Edison houses. One photo, although presumably misidentified, shows the razed Monroe Street terrace in the background.

The Pennsylvania SHPO, Pittsburgh Landmarks, Inc., and Athenaeum of Philadelphia were contacted regarding a precedent for terraced worker housing in that state, and for information regarding the architect Creighton. Unfortunately, they were unfamiliar with the term terrace housing "based on the Philadelphia plan" reported in one of the period Gary newspapers. Creighton was not an architect familiar to the groups, but a contact at Carnegie Mellon University, provided by Pittsburgh Landmarks, has expressed interest in pursuing additional research into his career.

I. Major Bibliographical References

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UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

REQUESTED ACTION: COVER DOCUMENTATION

MULTIPLE NAME: Concrete in Steel City. The Edson Concept Houses of Gary,
Indiana MPS

STATE & COUNTY: INDIANA, Lake

DATE RECEIVED: 05/11/07 DATE OF PENDING LIST:
DATE OF 16TH DAY: DATE OF 45TH DAY: 06/24/07
DATE OF WEEKLY LIST:

REFERENCE NUMBER: 64500981

NOMINATOR: STATE

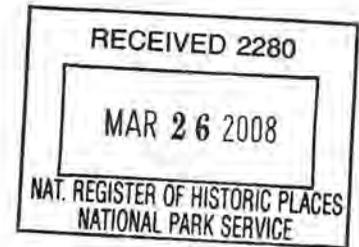
ACCEPT RETURN REJECT 6/22/2007 DATE

ABSTRACT/SUMMARY COMMENTS:

Cover form establishes the historic context, property type &
registration requirements for 74 concrete worker's houses
built in the early 20th century in Gary, IN

RECOM./CRITERIA Accept cover
REVIEWER Patrick Andrus DISCIPLINE Historian
Phone _____ Date 6/22/2007

DOCUMENTATION see attached comments Y/N see attached SLR Y/N



March 19, 2008

Dr. Janet Matthews
Keeper of the National Register
National Park Service 2280
National Register of Historic Places
1201 "I" (Eye) Street, N.W.
Washington D.C. 20005

Dear Dr. Matthews:

Enclosed is additional documentation for the Multiple Property Documentation Form for the Concrete in the Steel City: The Edison Concept Houses of Gary, Indiana Multiple Property Documentation Form, Lake County, Indiana. It now includes information about the Reichert Company that manufactured the metal forms and the addition of a concrete apartment building that will be an individual nomination in the future.

Very truly yours,

Robert E. Carter, Jr.
State Historic Preservation Officer

REC:AEW:aw

Enclosure: nomination package